3dcreative

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Issue 080 April 2012

Majid Esmaeili
3D Character Artist

Gallery Artist
Gallery - 10 of the best images from around the world!

The Lantern
Project Overview by Khadyko Vladimir

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- Free Video, Assets & Ref Image

Rodrigue Pralier (3dsmax) and **Anto Juricic** (Maya) kick off our great new six part character series.

CHARACTER PRODUCTION

Cover image by Rodrigue Pralier

Armored Gorilla
In the next installment of our **Armored Beasts** series **Miro Petrov** talks us through the creation of his fantastic gorilla sculpt.

Guide to FX - Particles & Dynamics
Matt Chandler (3dsmax) and **Mike Zugschwert** (Maya) begin this new series by showing us how to create and animate water.

Building Droids
Working from a 2D concept **Victoria Passariello** shows us how to model and texture a cool Demolition Droid in our new series.

Editorial

Hello and welcome to the April issue of 3DCreative. In this month's issue we will be concentrating on modeling banana's using cardboard and will be showing you how to make your own 3D glasses using sticky tape and felt tips. This is, of course, an April fool's trick, but hopefully the tricks you remember from this issue will be the excellent ones provided by our fantastic tutorial artists!

I think we will start this month by chatting quickly about the amazing cover image. Created by the brilliantly skilled Rodrigue Pralier, this image comes from our brand new tutorial series which covers one of the most popular subject matters that we see submitted to the 3DTotal galleries: human busts. We have been really fortunate to rope in two fantastic artists to help us with this project. Rodrigue will be showing us how to create a stunning image using 3ds Max, while Anto Juricic will be showing us how to do the same using Maya, and similarly comes up with amazing results. In this issue they get the ball rolling by showing us how to create our base model.

On the subject of new series, now seems to be a good time to mention our new set of tutorials on FX, Particles and Dynamics. I am pretty sure each and every one of us has watched a film and seen an effect we thought was really impressive. In this series we will be shown how to create some of these amazing effects, with Matt Chandler working in 3ds Max and Mike Zugschwert doing the same using Maya. In the first part of this new series these mega-talented guys cover how to create and animate water.

Two new series – wow, you guys have been given a massive treat this month! But wait there, what is this? Yes we have third new series in this issue! A high proportion of the potential jobs that you can do in 3D require you to be able to create an accurate model using a 2D concept. In this series our artists will be using stunning 2D concepts and technical drawing created by talented 2D artists to show us how to build droids in 3ds Max. In this first installment we will be in the more than capable hands of the talented Victoria Passariello.

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What's in this month?

Editor
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As well as a load of new series in this month's magazine, we also have the next installment from our Modeling Armored Beast's series. In this month's issue Miro Petrov looks at how to create simple concepts using photographs and turn them into a stunning ZBrush image.

As if all this wasn't enough we also have a fantastic interview with Majid Esmaeili, a Making Of by Khadyko Vladimir and an inspiring gallery featuring art by James Busby, Andrew Hickinbottom, Damir Martin and many more talented artists.


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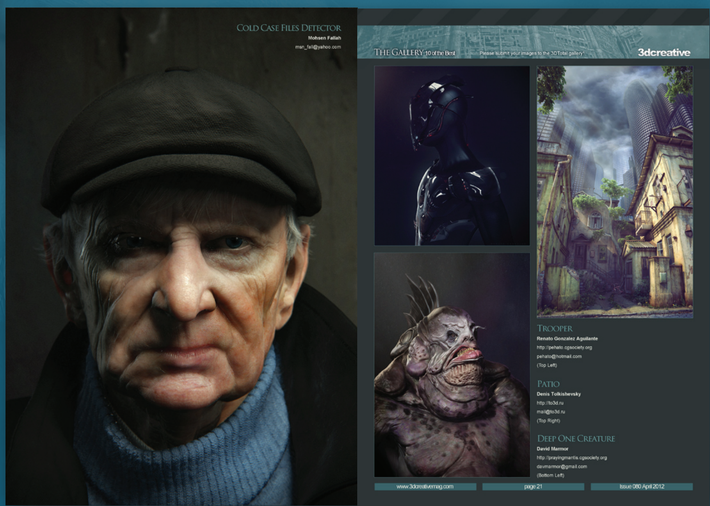
Get the most out of your Magazine!

If you're having problems viewing the double-page spreads that we feature in this magazine, follow this handy little guide on how to set up your PDF reader!



Setting up your PDF reader

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To view the many double-page spreads featured in 3DCreative magazine, you can set the reader to display 'two-up', which will show double-page spreads as one large landscape image:

1. Open the magazine in Reader;
2. Go to the VIEW menu, then PAGE DISPLAY;
3. Select TWO-UP CONTINUOUS, making sure that SHOW COVER PAGE is also selected.

That's it!

Contributing Artists

Every month artists from around the world contribute to 3DCreative, and you can find out a little more about them right here! If you'd like to get involved in the 3DCreative magazine, please contact: simon@3dtotal.com

Mike Zugschwert

Mike Zugschwert is an FX Artist who works in Realflow, Maya, and 3DS Max. He was the Lead FX Artist for the short film Azureus Rising and now applies his talents to television commercials. He is currently working at Make in Minneapolis, MN.

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Miroslav Petrov

Miroslav Petrov has worked at Masthead studios for 6 years where he started as a texture artist and worked hard to become an art director. Now he works as a freelance concept artist and illustrator. Some of his projects include: Earthrise MMO, Warmachine/Hordes by Privateer Press and Pathfinder by Paizo Publishing.

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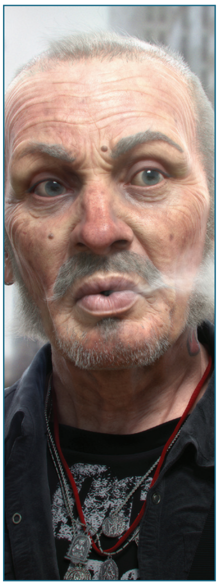

Rodrigue Pralier

Rodrigue Pralier is the lead Character artist at Bioware Montreal Quebec. After working in the games industry for nearly a decade he has recently shipped the highly anticipated game Mass Effect 3 and has previously worked on other games like Army Of Two:40th day.

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Khadyko Vladimir

For the last 3 years Khadyko Vladimir has been living in Israel with his beloved wife and daughter. About six years ago he started to learn 3D and after teaching himself for just a year he started working in the field of architectural visualization and still does today.

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Would You Like to Contribute to 3DCreative or 2DArtist Magazine?

We are always looking for tutorial artists, gallery submissions, potential interviewees, 'making of' writers, and more. For more information, please send a link to your portfolio, or send examples, to: simon@3dtotal.com


modo® image by Teodoru Badiu www.theodoru.com
03
Meet modo.
Luxology®

"I FIGURED OUT THAT PURELY LEARNING HOW TO WORK WITH DIFFERENT SOFTWARE PACKAGES WAS NOT ENOUGH TO BECOME A PROFESSIONAL ARTIST, AND I SHOULD FOCUS ON THE ARTY SIDE OF THE CG WORLD"

MajidEsmaeili

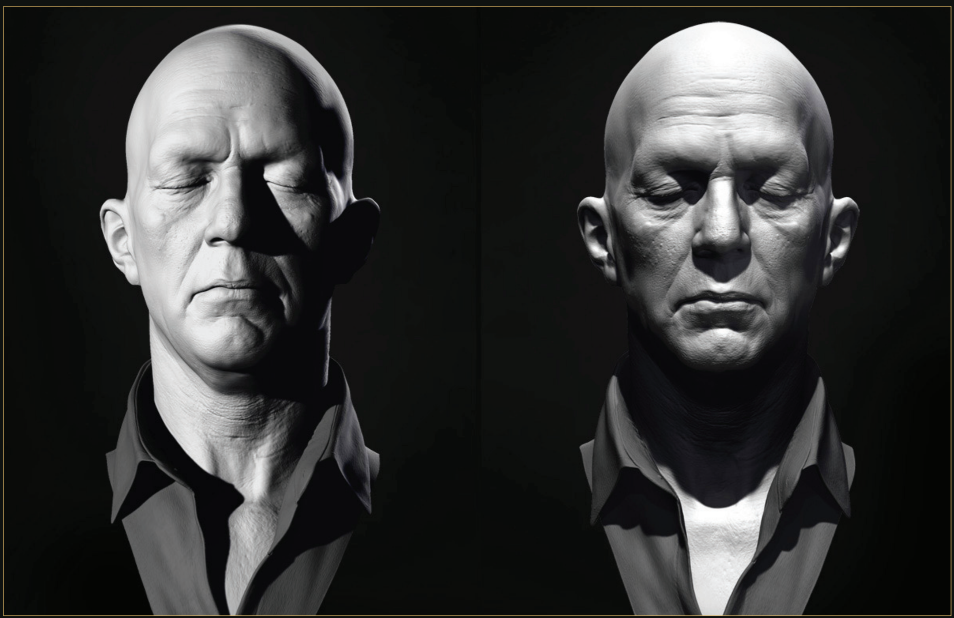
In this month's interview we catch up with the insanely talent Majid Esmaeili who tells us how he turned his back on a career as an electrician to follow his dream of working in the CG industry.

Hi Majid, why don't you start by telling our readers about yourself, starting from the time you first heard of 3D, or when your parents first gave you a pen and paper to draw them a picture.

Actually it's very hard to say how I started. I used to watch so many movies, as well as playing games and looking at different artwork. This really inspired me! I grew up when 2D Sega games like *Super Mario*, *Street Fighter* and *Mortal Combat* were popular. I always thought these had great graphics and strong characters. The *Mortal Kombat* series was particularly influential as it was based around a bunch of exciting characters and creatures. All of this really inspired me and that was how I got into 2D and 3D computer graphics.

I was in love with art, film and animation. Unfortunately I found it really hard to learn about these in Iran. I studied as an electrician, although I found it difficult to concentrate on the course! So after I graduated I decided to focus on what really interested me and what I would love to do for the rest of my life.

During high school I had learnt how to use Photoshop and Illustrator, and so after graduating I was able to go and work as a 2D designer in advertising, which I did for a long time. I collected a lot of resources and started to learn how to use Macromedia Flash, Adobe Director and Adobe InDesign.



After this I made a few multimedia applications for some companies in my hometown. Later I started using Cinema 4D to add 3D elements to my work. From looking all over the internet I found that almost all major studios used Maya as the base 3D package in their productions. So I switched to Maya and watched different Gnomon DVDs to learn the basics of sculpting. Later I became familiar with ZBrush and it opened a new door to the world of CG art!

ZBrush is a great artistic tool that means you have less technical headaches than with most

packages. I figured out that purely learning how to work with different software packages was not enough to become a professional artist, and I should focus on the arty side of the CG world. Therefore I started to study from different resources so that I could learn about and understand shapes, forms, clothes, weight, color, light, anatomy and all the other elements that make something look good.

Can you give us an idea of how you felt when you started to make your first models? How difficult was it to find the best workflow to make your ideas shine?

At the beginning I found everything confusing, like working with maps, different anatomy, different meshes and topology, different pipelines and different ways to make a model. I had a lot of questions in my mind, but fortunately through the CG websites and forums, and by experiencing different techniques, I found that the best way to achieve what I wanted was to focus on the type of artist I wanted to be. In fact, everything we learn should be used to help us achieve the best results we can.

I was always very willing to work hard and paid attention to the advice given by many of the best artists, which was, "fill your sketchbook!" I did a lot of work and shared it in forums to get constructive feedback. I showed my work to other artists, as well as people that might not have even known about CG. Sometimes I imagined my work to be somebody else's, and looked at it from a different point of view. This helped me to find my weaknesses and find a way to improve in the future!

Do you have any advice for other artists trying to get started in the CG industry?

The most important part of the job is the final result and the quality of the image. If the final result isn't any good, it doesn't matter what software you used or how you used it. Software and technology is adapting and developing

quickly, but the fundamental values are always the same. That's why the masters are still masters! Continuing to study and practice is the key to success; just keep working hard and comparing your work with your own and that of other artists, and check to see how you're progressing. By doing this you will be able to find which parts you should focus on and try to improve!

Studying and understanding anatomy is also very important. There are a lot of secrets and tricks you can use to improve your use of anatomy. You should try to learn more about the body's structure, bones, how muscles and bones interact together, flow, shapes, forms and more! You can find many resources over the internet, in books, DVDs or online classes etc. Don't just count on one or two books though. Do research to develop your ideas and find your own resources!

I've noticed that you do a lot of character studies and that with each one you try to demonstrate their attitude and backstory. How long do you tend to take to create your models?

I like to study everyday to improve my skills and knowledge. I try my best on each new project and try to use all of the things that I see around me to help me develop. I believe if you want to be a good artist and draw stylized

characters then you need to study realism. All great animation artists are able to draw realistic characters. Even characters drawn in a cartoon style are just simplified forms of these.

The timeframe depends on each individual project. Based on the complexity and type of work it can take from just a few days to more than a month to complete. Normally I like to ask for a schedule from the client before I start. I'll only do the project if I know I can finish it in time! I then start by finding references and researching to get everything I need to complete the project.

A good model should have a strong mesh and to achieve this you will need to achieve some technical goals. A good mesh can be created by having a good edge flow and topology to get

the model ready and make it easy to animate. It should also be easily readable, with a good silhouette from all angles, and be kept to a basic forms as much as possible. However, this does depend on the client's preferences, the subject you are modeling and the number of polygons you can use. I try to get all this information before I start a job.

During a project, have you ever found yourself in the position where you've stylized your model similarly to a previous one, or that your design has led you closer and closer to your previous work?

Sometimes you do see a repetitive style in your work. I sometimes find that tackling similar projects can result in your designs becoming limited and similar. To avoid this, I always try to tackle different topics in my personal work. The easiest way to go about doing this is to go out and experience new things and gain new inspiration.

Could you describe your creative process and tell us what part of 3D you like the most and why?

I've experienced a lot of different projects, from cartoony and stylized characters, to cinematics, games, film and toy character creation, and I'd like to have a go at doing even more different types of work. I try to concentrate on the quality of my work and I keep myself up to date with CG news. I like to try new techniques and software to find the best way to create an outstanding piece of work!

Before I start I visualize the work and try to work out the best and easiest way to finish the job. I start by shaping the basic and secondary forms, and then add wrinkles and other micro details. Sometimes I use my own base meshes and develop the model by going back and forth between Maya and ZBrush via GoZ. Every so often I have to start a new base mesh in Maya and re-mesh the sculpture. I then use Maya for tweaks and to add the final details.

When I import the model into ZBrush I start with polygrouping and separate pieces. I've found the best way is to set up the UVs and then use Auto Group with UVs, but sometimes I separate them too.

I then add texture to my model with some basic colors and polypaint, and continue to work on the textures in Mudbox and Bodypaint, using Photoshop for the final touches. I also generate a variety of maps, which I sometimes adjust in Photoshop. Then I set up the model in Maya, connect all the generated maps and get it ready to use!

I use ZBrush for the final render, particularly since the release of ZBrush 4 R2B, which is really impressive! In fact it is so good now that you won't be able to tell if it has been rendered

in ZBrush, mental ray or V-Ray! Sadly though some parts of the process are not that much fun; setting up the model in your main 3D package and connecting maps is really annoying! I hope there will one day be a solution to this sort of thing so the whole process feels more artistic and less technical. For now though there is no way to work around these technical aspects and we just have to accept them as a part of this job!

A few of your characters really stand out. For me personally it's The Orphan and Pan. I particularly like the way you blended Pan into his environment. Have you ever thought about doing something similar with your other characters; combining organic and inorganic features and elements?

The Pan statue is based on an original concept from the *Pan's Labyrinth* movie. I liked the originality of the character so I'm pushing myself to do something like this again or maybe even better in the future!

Are there any elements of working in 3D that you would still like to tackle and master?

Sometimes I get tired of working on models and assets. I usually put them to one side for a while so I can come back to them with fresh ideas. This way I can develop them in a much better way.

Do you have any particular career goals at the moment? What can we expect to see from you in the future?

I have multiple goals, but overall I want to, and am trying to, get a position that could lead to a production out of my own ideas. It will take time to achieve as I will need to be confident and experienced in the industry!

Thank you for taking your time to do this interview – now I will let you get back to modeling!

Thank you for the interview. All my best wishes!

Majid Esmaeili

For more from this artist visit:

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Interviewed by: Predrag Suka






the GALLERY

This month we feature: Renato Gonzalez Aguilante | Mohsen Fallah | David Marmor | Denis Lebedev
James Busby | Hasan Bajramovic | Denis Tolkishevsky | Tomasz Strzalkowski | Damir G. Martin | Andrew Hickinbottom

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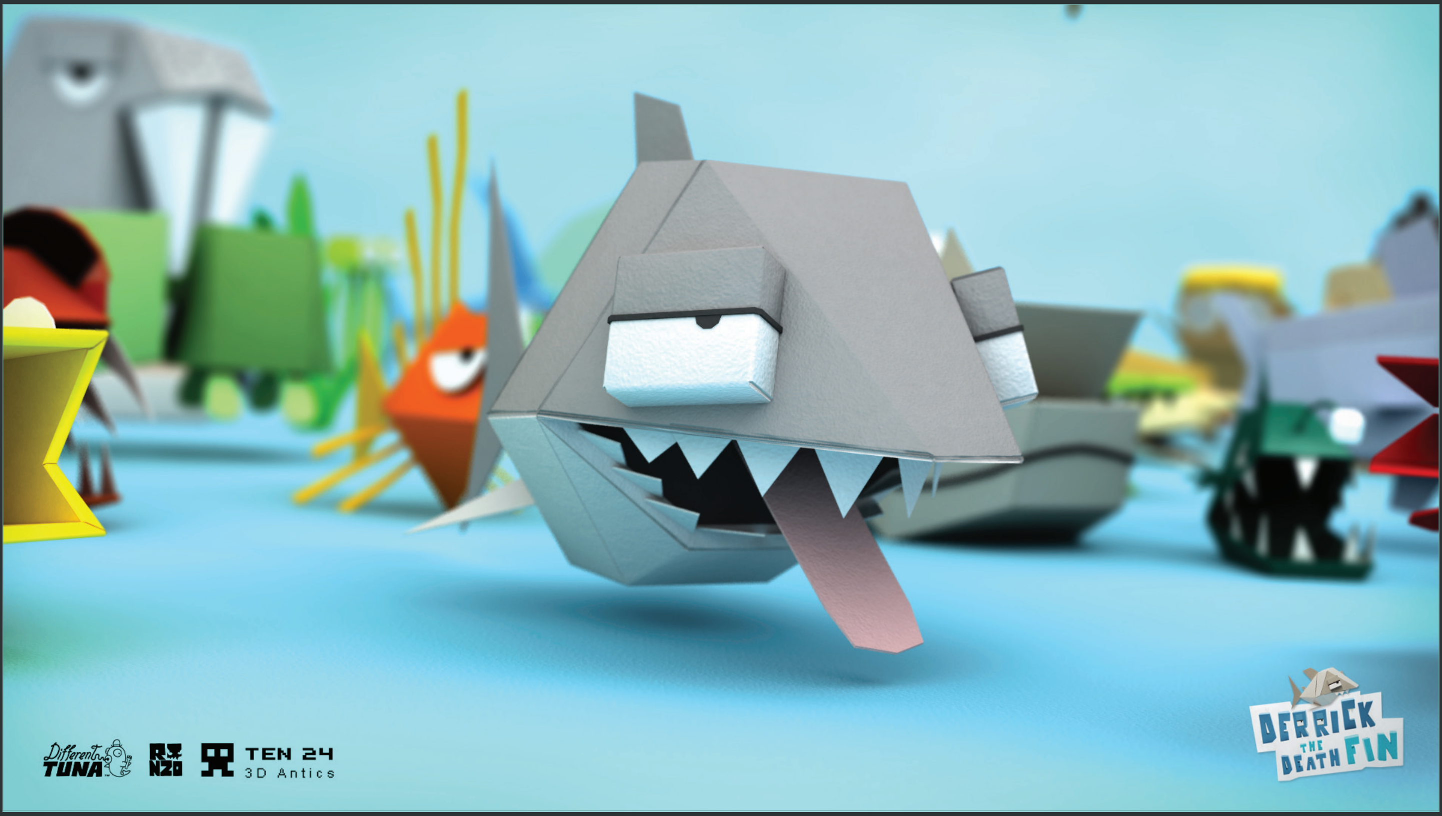

Derrick The Deathfin

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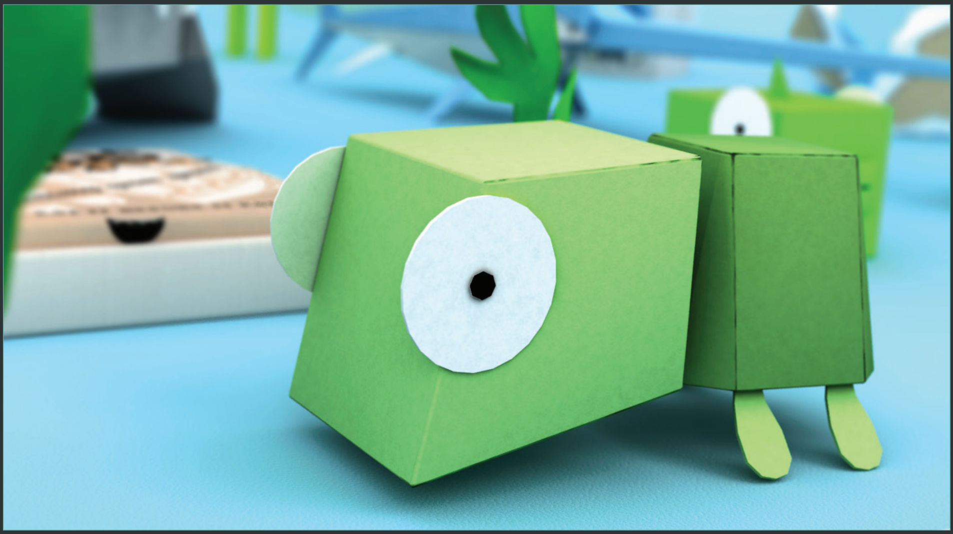
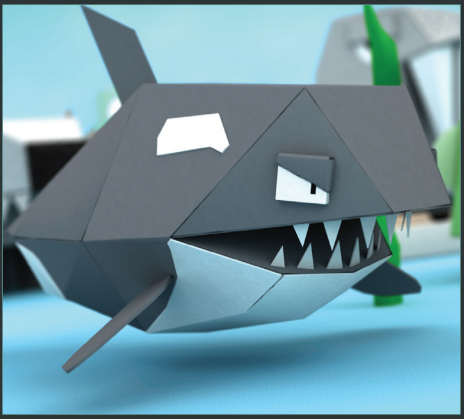
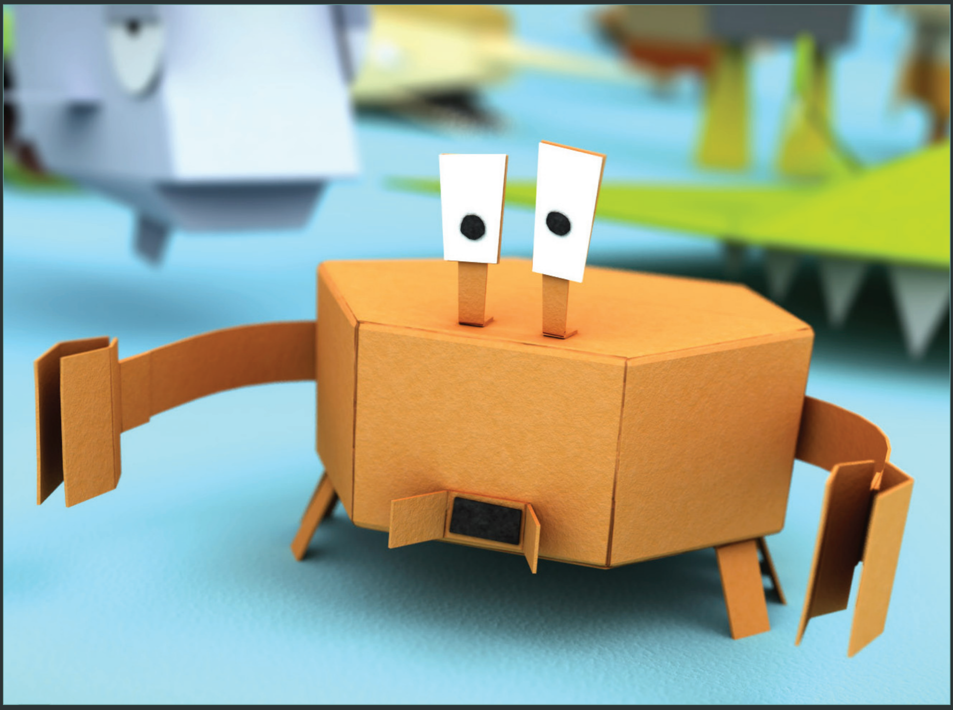
Tim Brown, Andy Turner and Chris Rawlinson also contributed to this project.








ANCIENT SPACESHIP
Tomasz Strzalkowski
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GUIDE TO FX -

PARTICLES & DYNAMICS

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3DCreative are branching out from creating stills in this amazing tutorial series, which will be looking at how to set up FX and particle systems in 3ds Max and Maya. Our amazingly talented artists will tackle some of the most common and popular effects, and will show us how to set them up and manipulate them to match an environment of your choice.

3ds max

CHAPTER 01 **WATER**

CHAPTER 01 – WATER

Software used: 3ds Max

3ds Max is a powerful 3D, animation and visual effects tool where a wide variety of content can be created. Generally its good practice and also economical to try and keep your project work confined to a select number of applications, such as 3ds Max for the 3D work and Photoshop for texturing etc. However, there are times where the content we wish to create is either limited within our application of choice, or perhaps absent altogether. In this case we are going to go over a beginner to intermediate project that includes some fluid simulation.

In the same way that two modeling artists may model the same head, but each use different tools and/or methods to create it, effects such as fluid simulations (water, molten lava, paint, etc.,) can also be created with a variety of techniques, and we can usually make an educated guess as to which method we should use to complete the effect. A typical example of such a scenario would be to create the surface of the ocean; would we use a simple plane with appropriate deformers and animation to create the illusion of a rolling surface? Or would we simulate a huge data set within fluid simulation software, using a vast amount of system resources, when the end result for both may end up looking the same? This depends entirely on many contributing factors to a VFX shot and sometimes you may end up combining multiple methods.

In the accompanying video to this tutorial (which can be downloaded by clicking on the free resources tab) I briefly go over some options for pseudo fluid FX directly inside 3ds Max, which may be applied to a wide variety of VFX shots. There are times, however, where faking it simply won't be good enough and so we must spend some time using more complex methods or software to achieve more realistic results.

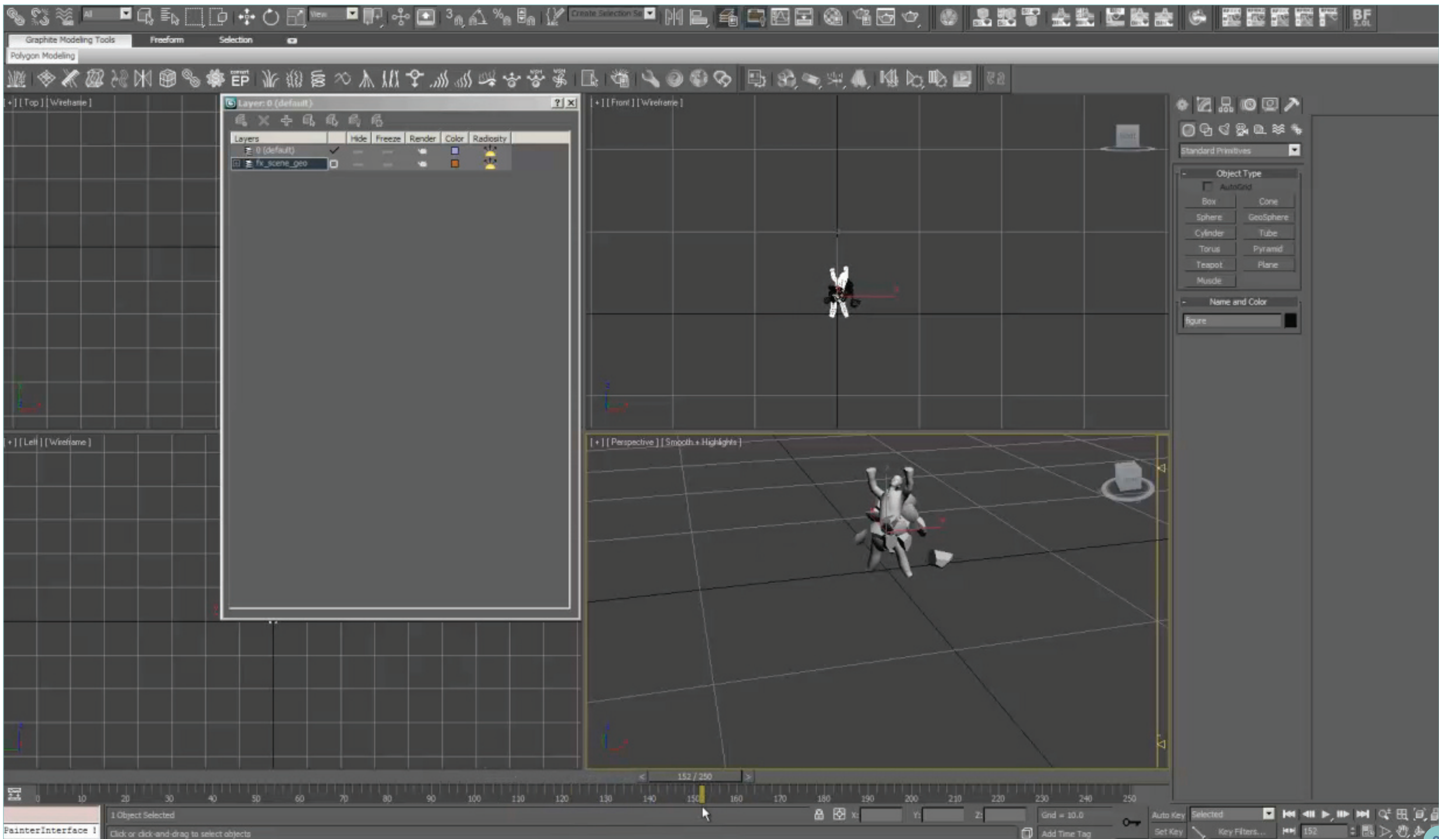
In this tutorial we will be doing this by taking a cached scene from 3ds Max and importing it into RealFlow to create some believable fluid simulations. RealFlow has become somewhat the industry standard application for CGI fluids/ particle simulations and allows us to create anything from raindrops to rolling ocean waves.

Let's get started. Open the provide 3ds Max scene file (Fluid_scene.max). This will work with 3ds Max 2010 versions and later. The scene contains a low resolution mesh/figure and some rock geometry. You may need to reload/redirect the point cache file to see the animation. You will find the PC file in the Assets folder.

As the figure rises from the ground, rocks are pulled towards him, colliding with each other, spinning and then falling to the ground as if our character can perhaps control his surroundings.

I created the rocks with Rigidbody dynamics and the figure is an altered and reverse motion capture file (**Fig.01**).

Tip: It's very important to work at the appropriate scale when exchanging data to and from another application. To make sure your scene will import and export correctly into RealFlow, switch the units in 3ds Max to Meters.



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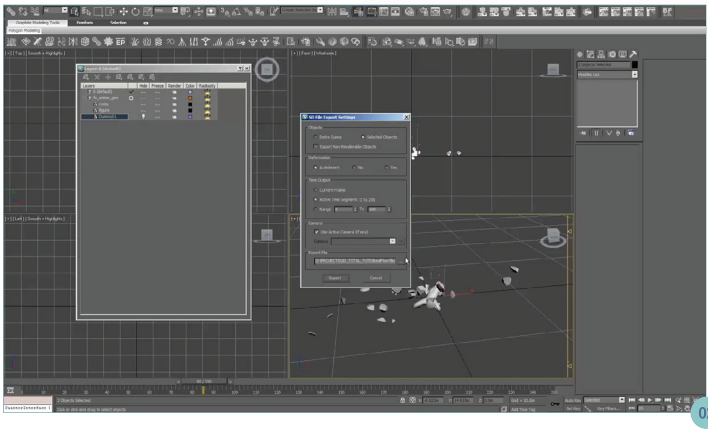

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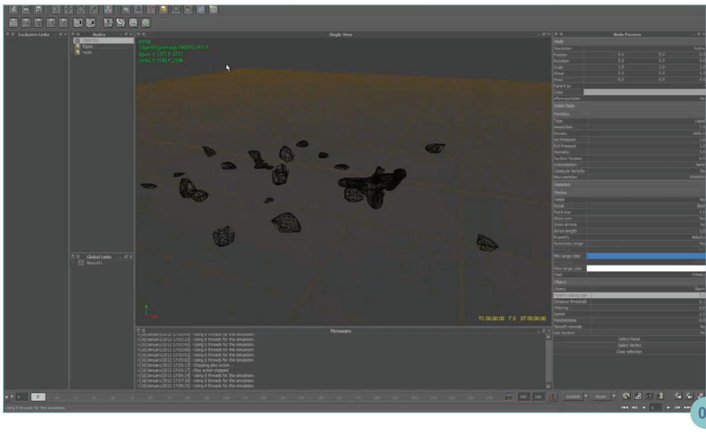

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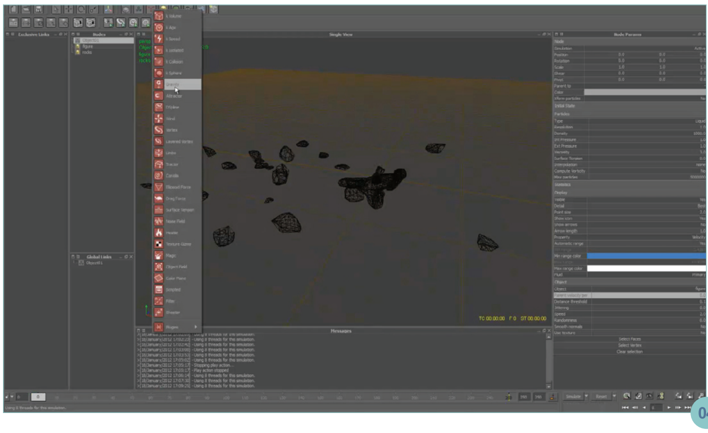

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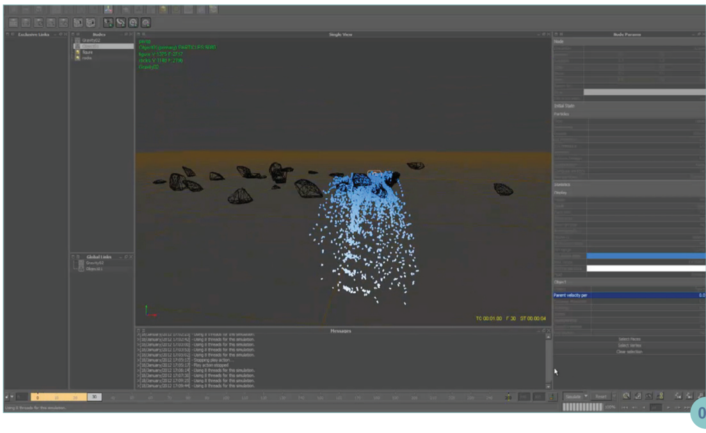


05

Now make a 1,1,1 meter cube and export it as an OBJ or a RF SD file. Each grid/square in the RealFlow viewport represents 1 meter in scale, so by importing the cube you can ensure your geometry is importing correctly, or make some adjustments in your 3ds Max scene to help RealFlow import at the desired size/scale.

Export the scene as an SD file as the scene contains animation and deformation. Under the SD file export settings menu (you should find this in your 3ds Max toolbar) ensure you have selected the objects you want to export, that Deformation is on auto/checked, the frame range is correct and that you have set a path to export to. Click Export and you will see a progress bar informing you that it has been successfully exported (**Fig.02**).

Now in RealFlow, import the SD file you have just created. It's good practice to keep the SD file inside the Objects folder that RealFlow will create when you start a new project. Scrub the timeline to ensure the file has come across correctly.

There are many fluid emitters within RealFlow and we will use the powerful Object Emitter to have our character emit fluids from his body/surface. Create an object emitter from the Particle Emitters menu.

On the left side of RealFlow are the Nodes and Links tabs, which list everything that is currently in your scene and what is affecting what. So far we have rocks, the figure and our newly created Object01 fluid emitter node.

Select the node and look over at the parameters on the right side of RealFlow. Whatever node or object you select from your nodes list, the parameters and controls should appear on the right side by default (**Fig.03**).

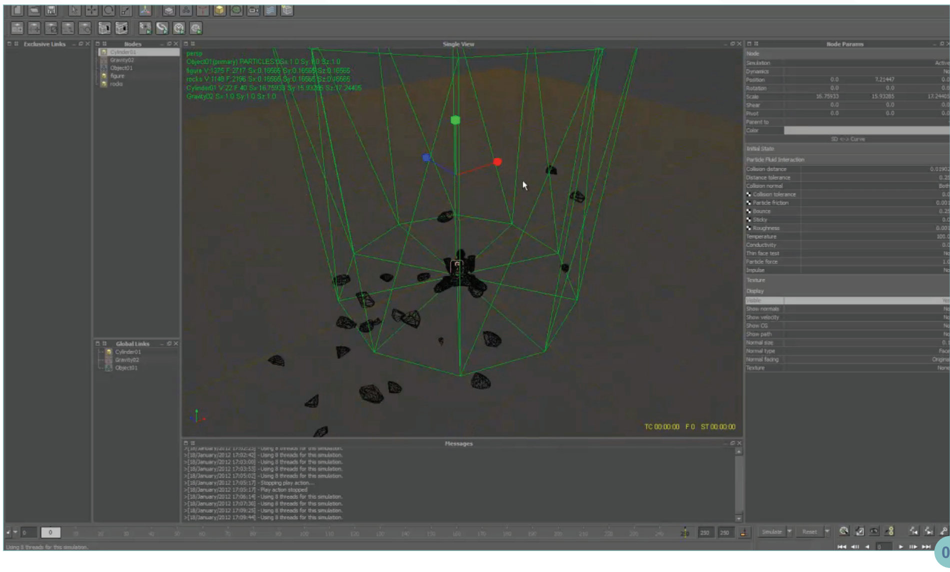
Leave all the fluid settings at their defaults for now. Scroll down until you see the Object tab. We need to add our figure so particles know where and what to emit from. Click on the object list and add the figure. If you hit Simulate now you will see particles flying out in random directions and lines from the figure mesh. If you don't, ensure there is a value under the Speed tab otherwise the particles will not appear. Let's now add some gravity to our scene. Go to the Daemons menu and select Gravity (**Fig.04**).

There are a wide variety of Daemons within RealFlow, and interesting and powerful effects can be created when combining them. Note there is now a Gravity01 listed under the Nodes tab and within the Global Links tab. Hit Simulate again and you will see the particles are now affected by gravity and fall downwards (**Fig.05**).

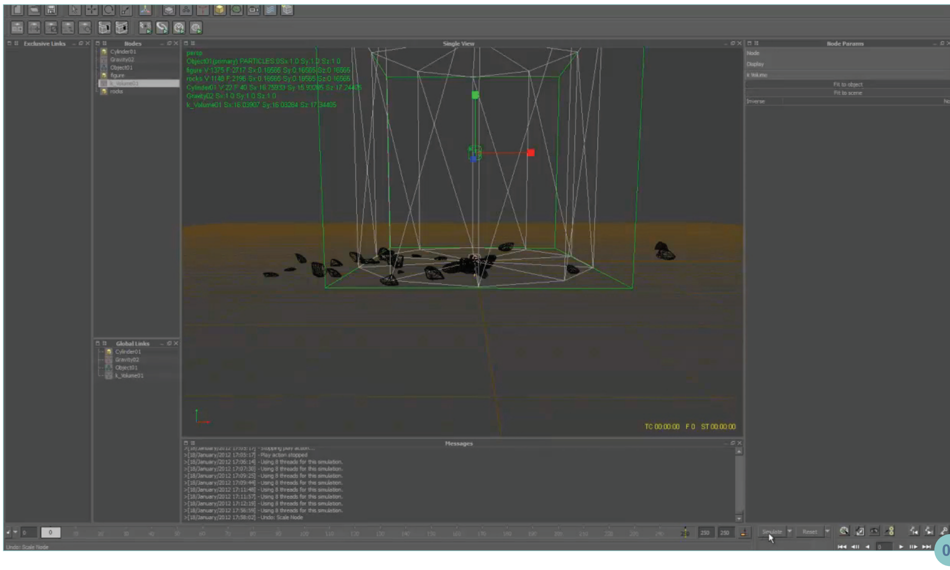
We now need to define the boundaries of our simulation by creating some additional geometry to stop the particles falling and flying off into infinity. You could prepare some geometry within 3ds Max with your scene and import it, or we could create some basic shapes within RealFlow itself.

Create a cylinder from the Geometry menu within RealFlow. Use the Transform and Scale tools to position and resize it. Note the cylinder appears in the Nodes and Global Links tabs.

Whatever objects appear in the Global Links tab do just that – they are all globally linked – meaning that they will all interact and participate in the simulation. The cylinder will act as a ground place and container to the particles. Also note the options available under Parameters when the cylinder is selected. You can adjust tolerances and behaviors such as friction and how sticky the cylinder surface might be (**Fig.06**).


06

Let's add a new daemon called K Volume to our scene. This is a simple container daemon that will further help to keep our particles under control. Any particles that escape boundaries/volume of this daemon are killed off. Use the Translate and Scale tools to move the K Volume daemon into place (**Fig.07**). Hit Simulate again.


07

The fluid is emitted from the figure and is interacting with the ground and other geometry in the scene. Now the basic scene is set we can start altering some parameters and refining the fluid simulation. To speed up testing the simulation, select the object emitter node and, under Resolution, reduce this number to 1 or less. Resolution is an important parameter that defines how many particles are emitted into the scene. Generally the more particles you have, the more realistic and detailed the simulation will be.

Let's add another daemon called Surface Tension. This daemon will help to keep the particles together and stop them separating too much. Run the simulation again for a few frames to see the results. Also try altering the Emission speed under the object emitter node to get different results. Enter a value under Randomness to encourage a more random emission pattern from the figure. Set Randomness to 1 and Jitter to 0.6, then hit Simulate (**Fig.07**).

Now let's animate the emitter as we want the figure to stop emitting fluids. By right-clicking on the desired parameter whilst the emitter is selected you will bring up a menu where we can add animation keys. To set the speed to 0 at frame 0 – right-click on the Speed tab and add a key. At frame 30 – set the speed to 2, right-click and add a key. Go to frame 180 and add another key. Move to frame 190 and set the speed to 0 and add a final key.

Hit Simulate and see how the fluids emit and then stop. You may wish to alter the key frames or values. Right-click on the Speed tab again and select Curves. This opens a typical animation curves rollout/graph where we can see animation keys and interpolation. Adjust the curves to your liking.

Select the object emitter again and raise the Resolution to 1. Let's also change the Internal and External Pressure values; set Internal to 1 or .98 and set External Pressure to 3.

You may also wish to try different values for Viscosity depending on what effect you are after. The default of 3 or 4 will behave like water – something like 8 will begin to move much more like slime or lava.

Some of the particles during the simulation may appear to shoot off occasionally due to high speeds/velocities. We can keep our scene clean by adding a K Speed daemon to it. This daemon has some tolerance parameters that will evaluate how fast particles are travelling and kill them should they be going too fast! We need to find out how fast our particles are travelling to be able to put a useful value into the K Speed

daemon. Select the object emitter and under the Node parameters, look under the Display menu for the total.

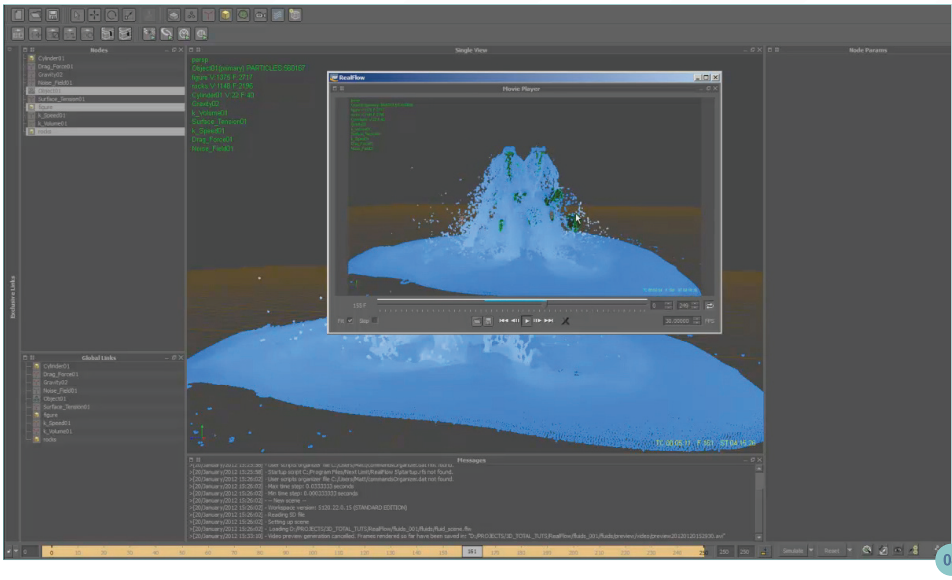
By default you will see the velocity and as you scrub the timeline you can see the particle min and max speeds (**Fig.08**).

If your particles have an average speed of 15, for example, enter 20 or more under the K Speed daemon Max Speed value and hit Simulate. There should be a visible reduction of stray single particles that leave the main body of fluid. The particles' speed is tested and if they exceed the max value, they are deleted.

Other daemons you could add are Drag and perhaps a Noise daemon. Drag is a useful feature that adds a level of resistance and dampening to the speed of the simulation, as if the particles are being affected by air resistance. The Noise daemon can be useful in creating some randomness to the shapes and flow of the fluid over time. Again, these daemons can be animated to only affect the particles at the desired time in the simulation.

Let's now increase the resolution of the object emitter to 8. This will mean a much larger amount of particles will be created in the scene so we can get better detail and a clean surface/mesh. The simulation time will also now increase. Hit Simulate and allow the sim to complete. How long this takes can depend heavily on your system/hardware. The more processors and RAM you have available, the faster your RealFlow simulation will go. However, there are some optimizations we can make within RealFlow to help speed things up.

Click on the arrow next to the Simulate button and select Options from the drop down menu. This menu has a min and max Substeps value, which defines how accurately the simulation will perform. By default, the maximum value is often too large a value for many simulations. Lower the maximum Substeps to 166.



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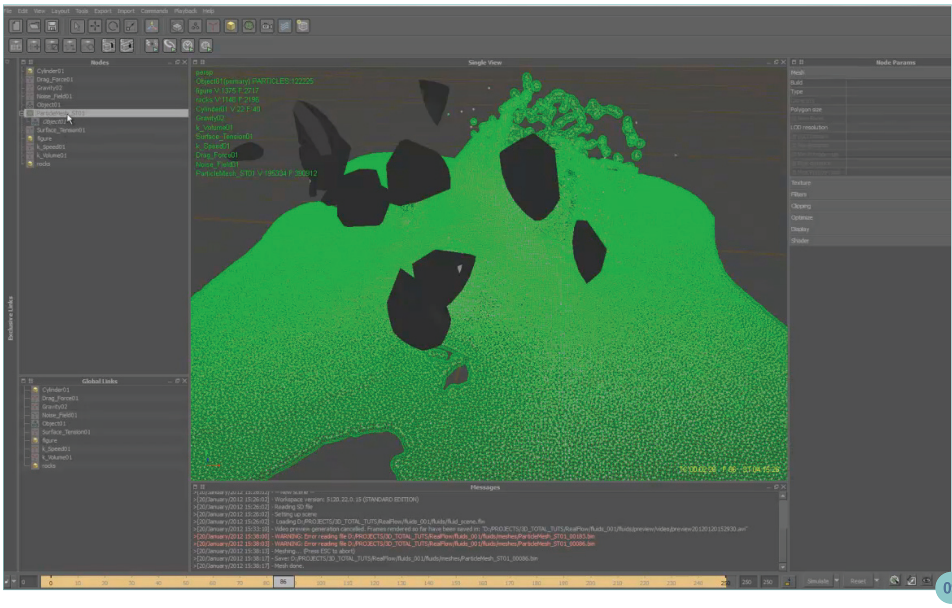


09

Note: In this menu you can also alter the frame rate of your fluid simulation. Setting higher FPS values can make fluids move more slowly and appear larger when played back at more conventional frame rates such as 24p (**Fig.09**).

Review the completed simulation. Now let's create a mesh within RealFlow that can be brought into 3ds Max. Click on the meshing and select Particle Mesh. This will add a mesh node to the Nodes tab. RealFlow will automatically assign the object fluid emitter in the scene to the particle mesh. Right-click on the particle mesh node and select Build.

After a few seconds the mesh will appear around the particles. Meshing within RealFlow can be somewhat an art in itself and it's a matter of playing around with the values and node parameters to get a good result. Of course, there are also alternate methods for meshing the particles within 3ds Max, such as third party plugins like Frost and Glu3D, both of which I take a more detailed look at in the accompanying video.

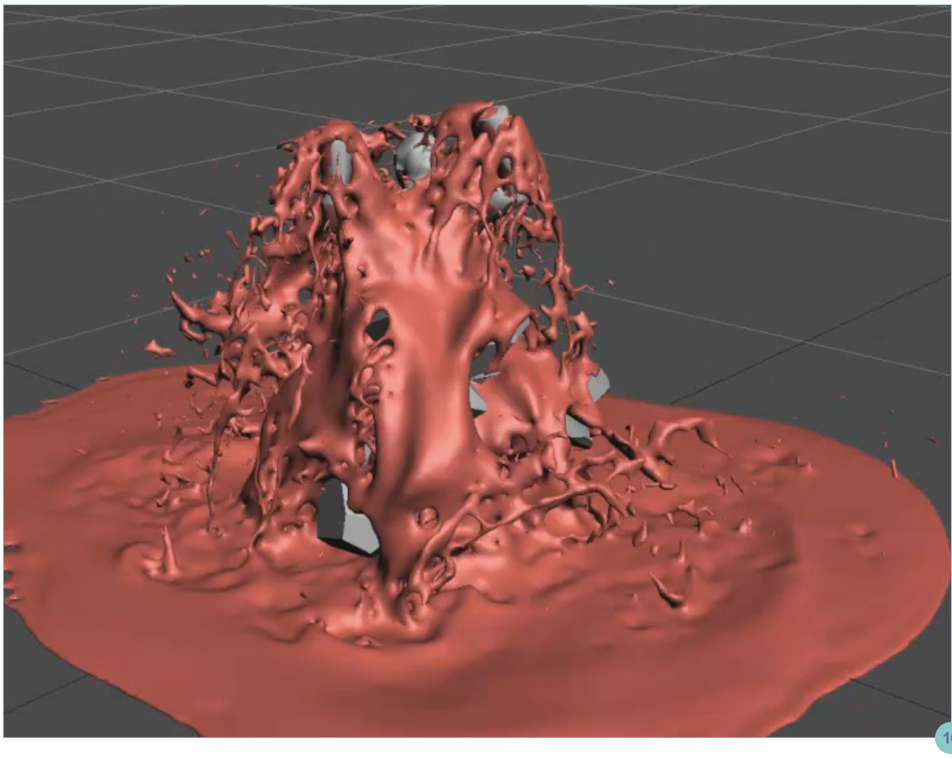
Once you are happy with your mesh and have created the mesh for the sequence, each frame of the mesh, as well as the particles, will be saved out to disk and ready to load into 3ds Max. Hit F12 to bring up the RealFlow Export menu. Here you can see a list of all data that can be exported from your scene. If you have created additional emitters and data, ensure

you enable the appropriate check boxes in this rollout to ensure it is saved out to disk.

Back inside the 3ds Max scene let's import the fluid mesh sequence. Under the RealFlow Import menu select Create BIN Mesh object and a dialog box will open to allow you to select the mesh BIN files. Select a file from the sequence and hit OK.

You should now see your mesh that was generated in RealFlow appear inside 3ds Max and be at the correct scale in relation to the other objects in the scene. This mesh can now be assigned materials and even other modifiers, like any other 3ds Max object.

I hope you enjoyed the tutorial and introduction to getting scene data into RealFlow, creating a simulation and exporting it back into 3ds Max. Of course there are numerous other options for bringing in the data, both the mesh and raw particles, some of which I briefly look at within the downloadable video (**Fig.10**).



10

Matt Chandler

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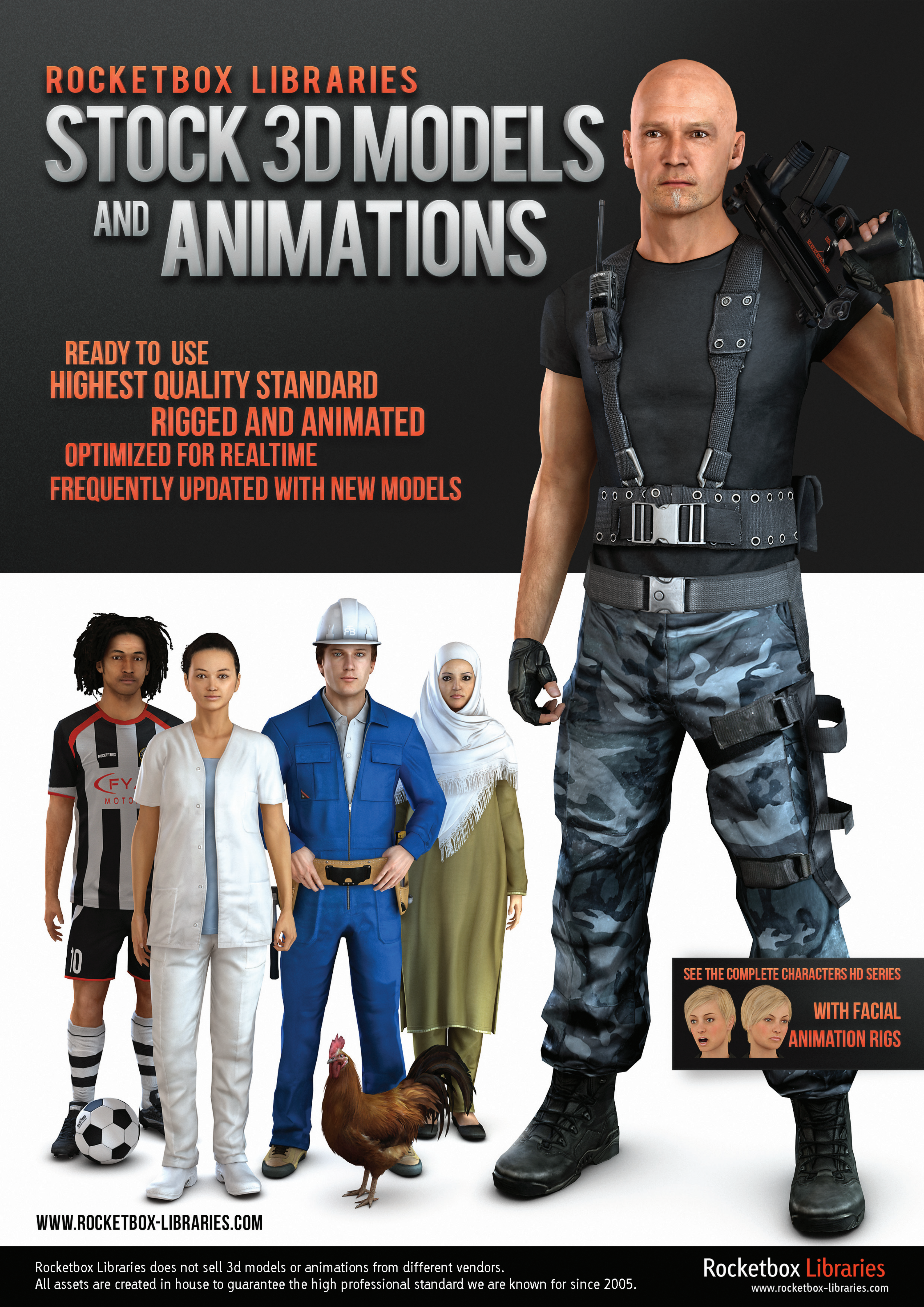

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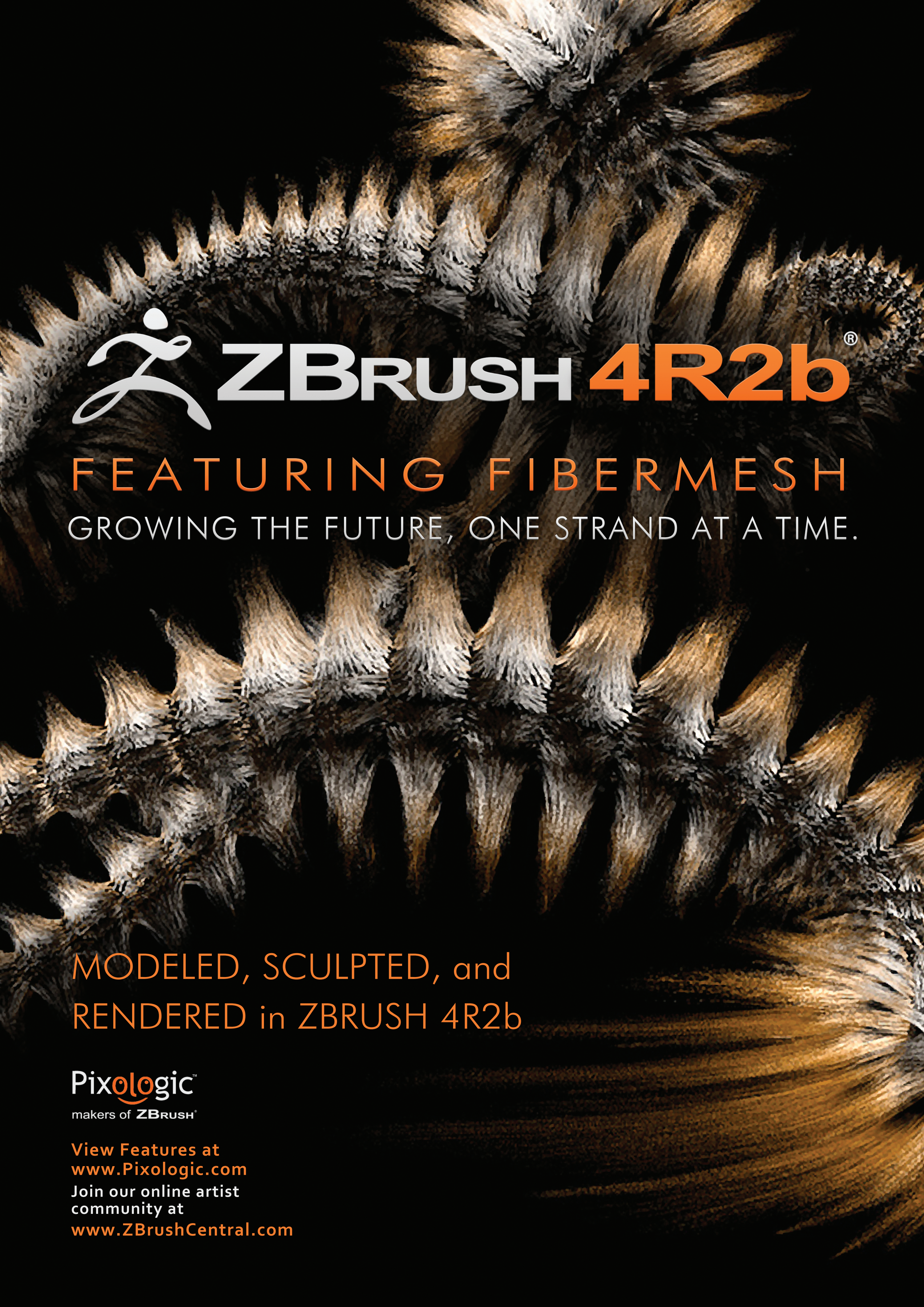
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GUIDE TO FX - PARTICLES & DYNAMICS

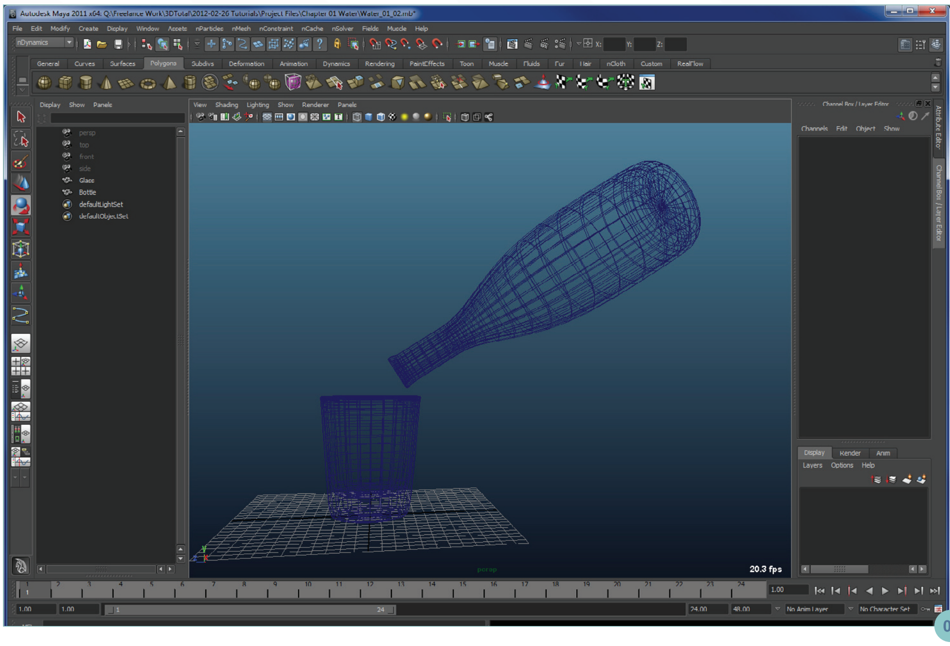
3DCreative are branching out from creating stills in this amazing tutorial series, which will be looking at how to set up FX and particle systems in 3ds Max and Maya. Our amazingly talented artists will tackle some of the most common and popular effects, and will show us how to set them up and manipulate them to match an environment of your choice.

CHAPTER 01 WATER

Chapter 01 – Water

Software used: Maya

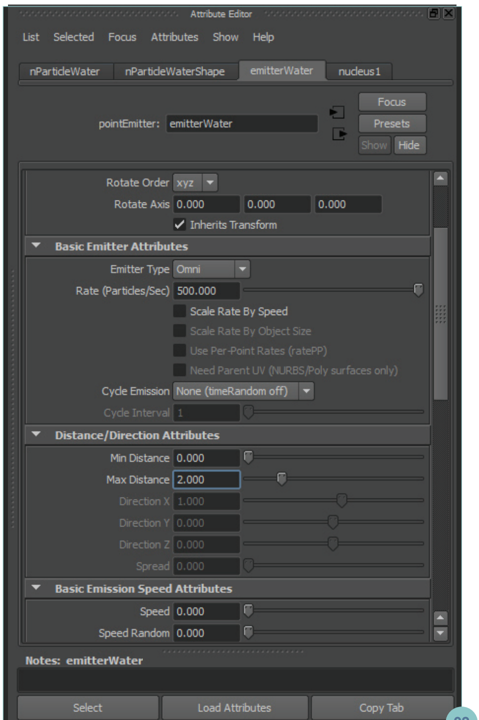
To start creating an animation of water I need some geometry to simulate my water against. I am going to model a glass and a bottle to pour water from. It is important to keep scale in mind when you model. In my preferences under the settings category, I make sure my working units are in centimeters and then I model everything roughly to real-world scale (**Fig.01**).



01

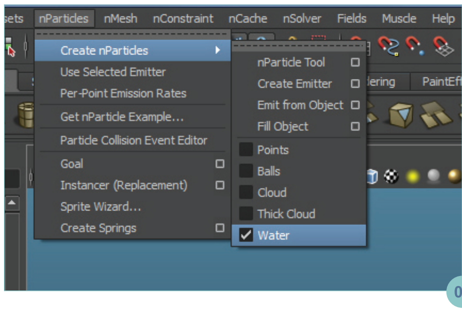
Now I can add some particles to the scene, but first I can take advantage of an nParticle preset. Under the menu nParticles > Create nParticles, there are five options for default particle settings (**Fig. 02**).

I select Water and then in the same menu, use Create Emitter. This will create an omni emitter and an nParticle object in the scene. By default, omni emitters have their Max Distance set to 0, which means all of the particles will spawn in the exact same place. This will be problematic for my water simulation because the forces that drive the simulation will cause the particles to shoot away from each other very quickly. So in the emitter's Attribute Editor, under the Distance/Direction Attributes I set Max Distance to 2 for now and I can adjust this later. I also set my emitter rate to 500 and place the emitter inside the bottle (**Fig.03**).



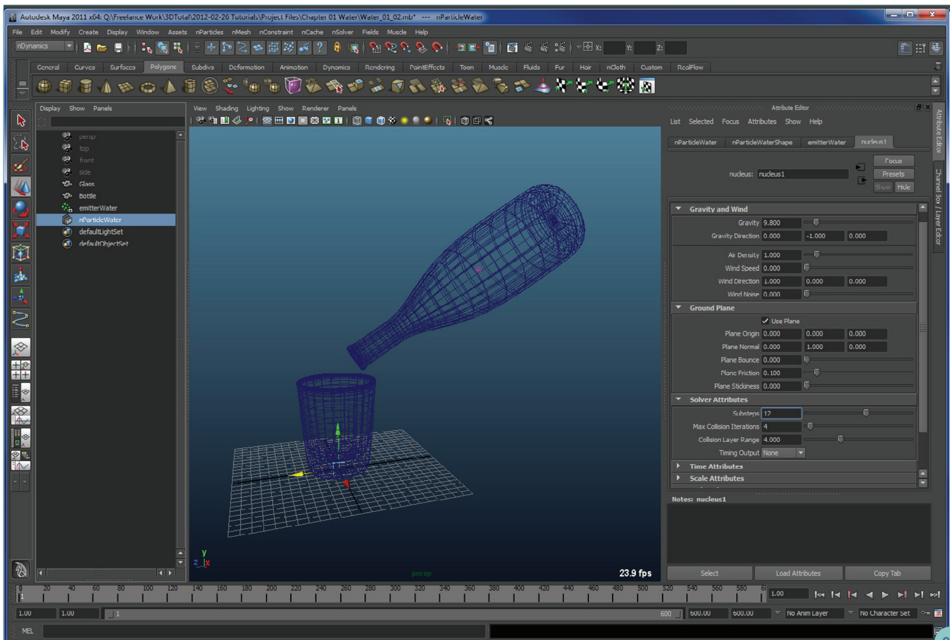
03

Another thing to change right away is the Substeps count for the nucleus solver. The default is 4, which can lead to unstable simulations. I turn it up to 12, and if during my simulations I see particles exploding or moving through collision objects I can turn it up more. Also I enable the Use Plane option under the Ground Plane options. This will keep any particles that miss the glass from falling into infinity. If I didn't create my geometry at the origin, I could create a plane in my scene to use as a collider (**Fig.04**).



02

Finally, I need to add the geometry as collision objects for the particles. With my geometry



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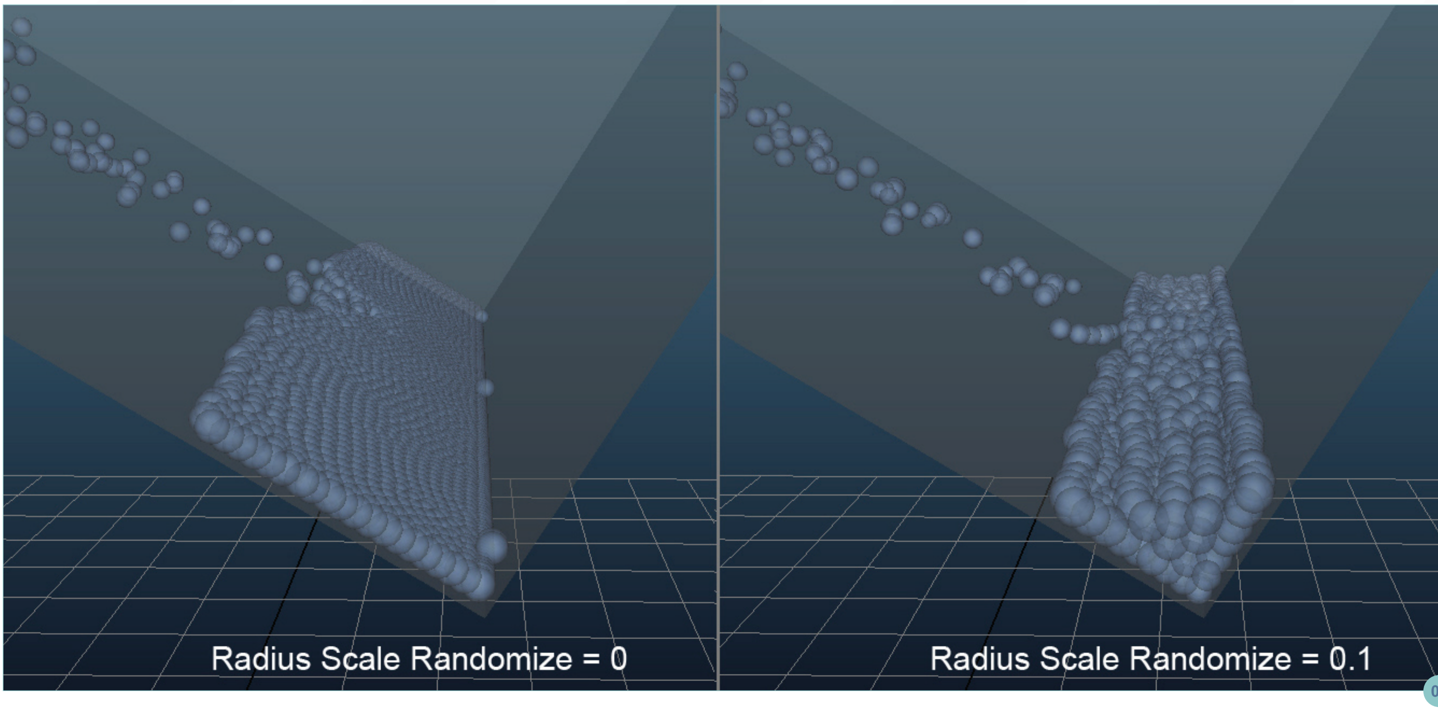


05

selected I go to nMesh > Create Passive Collider. This will create new nRigid objects in my scene for each object in my selection. In the Attribute Editor for the nRigidShape I can adjust the collision attributes like thickness, bounce, and friction. The default values should work just fine.

Now I can playback my scene to watch my simulation. The default values for the water preset work pretty well, but there are some improvements I could make.

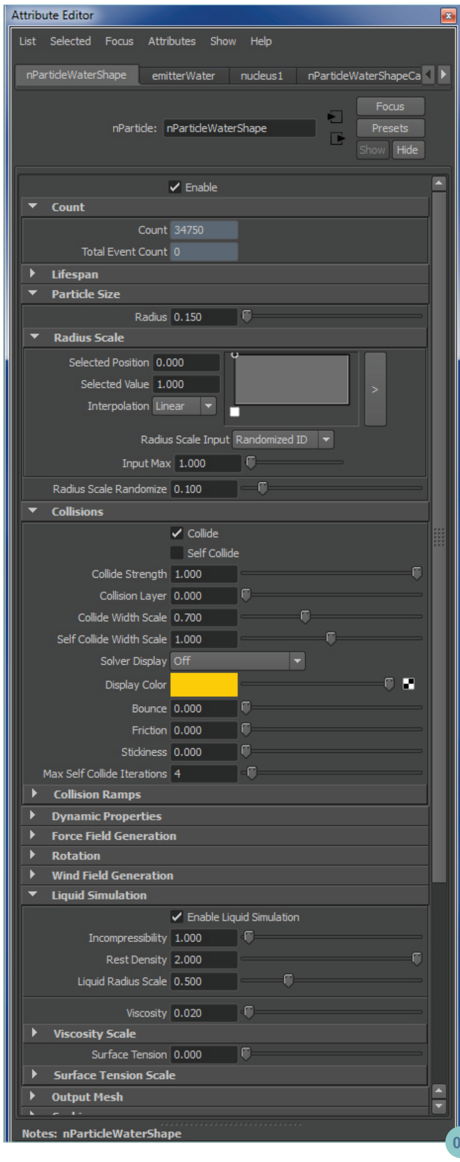
Tip: If you don't use the water preset, the most important thing to do is enable Liquid Simulations and turn off Self Collisions. With liquid simulations enabled there are attraction and repulsion forces that act on the particles to create the behavior of water that must allow the particles to interpenetrate. If Self Collide was turned on, it would interfere with the fluid simulation and you would not get fluid behavior.

In the nParticleShape tab in the Attribute Editor, I start by changing the particle radius. The larger the particle, the less I need to fill the glass but the less detail I will get in my simulation. A radius of .15 should work well for a scene of this scale. Also, I change the Radius Scale Input from none to Randomized ID and increase the Radius Scale Randomize to .1. What this does is randomizes the radius of the particles. This will help prevent the particles from stacking along surfaces, as shown in **Fig. 05**.

I also want the particles to interpenetrate with the glass a little so I can choke my mesh without leaving a gap between the mesh and the glass. To do this, I set my Collide Width Scale to .7.

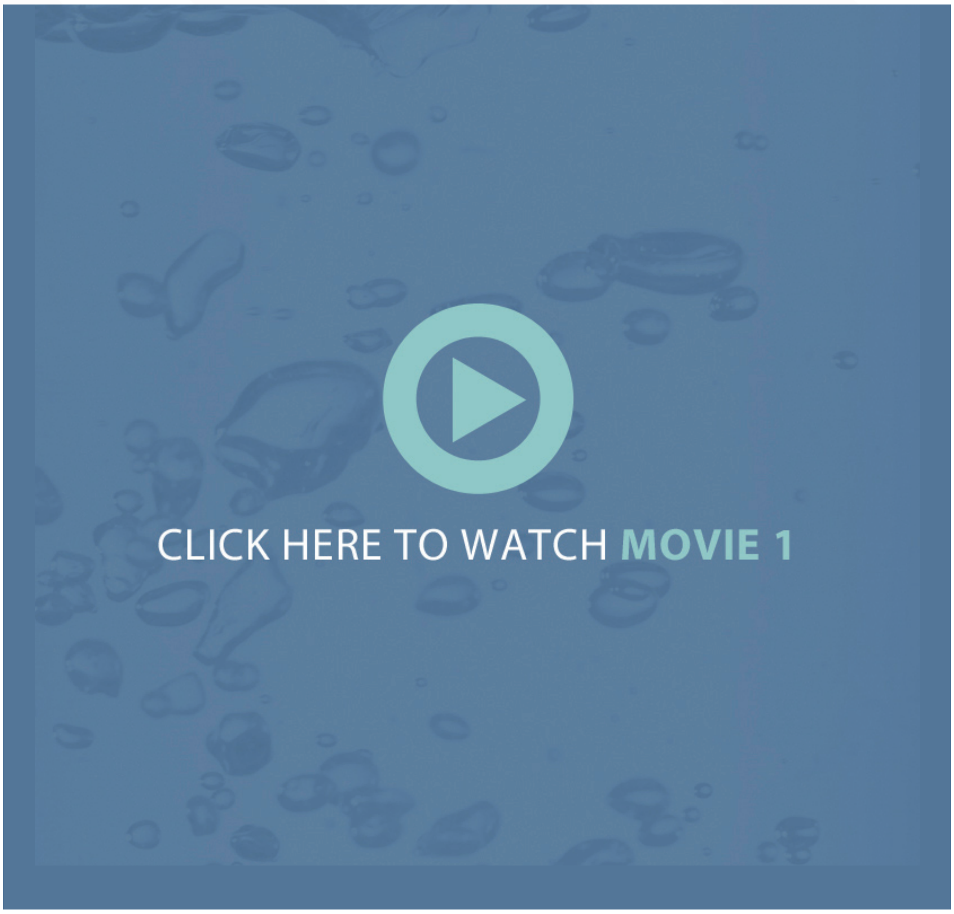
Under Liquid Simulation there is an attribute called Liquid Radius Scale. This will influence how much the particles will interpenetrate with each other. To get a smooth surface when meshing I will want them to overlap a lot. The default value is 1, which is way too high. I drop it down to .5, but keep in mind that the more I allow them to overlap, the more particles it will take to fill the glass.

The viscosity will change the behavior of the liquid quite a bit. Thicker liquids like honey or syrup have a high viscosity, while water has a low viscosity. I also key my emitter rate to cut off after 140 frames so it doesn't continue to pour forever. I may need to adjust the timing after seeing the first simulation. My final settings can be seen in **Fig.06**.



06

For faster playback, I can cache my simulation. In the nCache menu, with my nParticles selected, I pick the option box for Create New Cache. Here I set my directory as well as other options. I prefer to use one file per frame so that in the event of a crash, I can pick up from where it stopped instead of risking the whole cache becoming corrupted. Also, after I cache, there is a cache description info panel at the bottom of the Cache tab in the Attribute Editor. Here I can see what all of my attributes were when I created the cache, which can help me keep track of which cache had which settings.



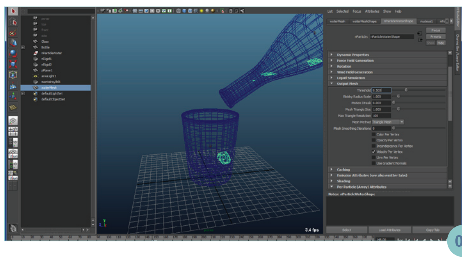
This simulation took 17 minutes to do 300 frames. The final particle count was 34,750.

That looks pretty good for a first simulation, although I would like to add some animation to the bottle so it doesn't pour into the same spot the entire time. I would also like the glass to fill up a bit more. I would guess around 150,000 particles, which will mean a rate of around 25,000 particles per second for 140 frames. I also raise the Liquid Radius Scale to .7 and run another sim to see how it looks.

This one I let run for 380 frames and it takes 3 hours and 5 minutes to run the simulation (this will depend on the power of your system). The total particle count is 144,791.

Now that I have a good simulation I can create the mesh. I click Modify > Convert > nParticles to Polygons. This will create a mesh in my scene and turn off the display of the particles to speed up the viewport.

The first time I do this I may not see anything on my screen or just a few blobs (**Fig.07**). This is


07

because the triangle size is too high. The value will depend on my scene scale. For my scene I end up with the values seen in **Fig.08**.

Threshold and Blobby Radius Scale will influence how the mesh blends between particles. Threshold chokes back the mesh based on the particle density.

Mesh Triangle Size will influence the size of the polygons that generate the mesh. Max Triangle Resolution will automatically change my Mesh

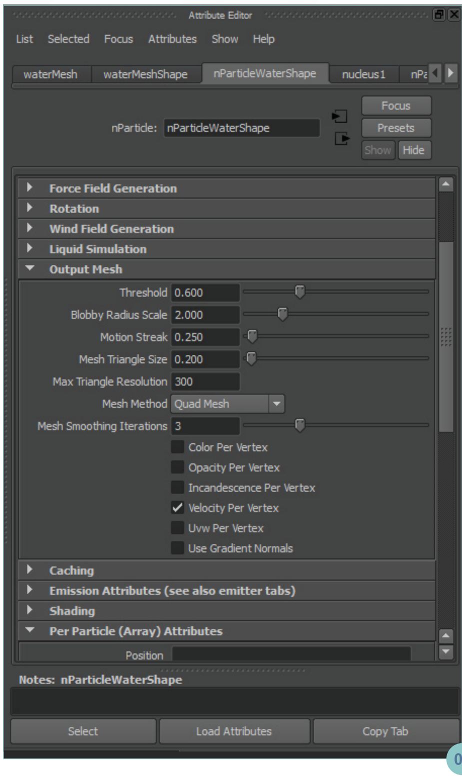
09

Triangle Size if the voxel grid that generates my mesh gets larger than the resolution value. Basically, if I set it to 100, and it takes more than 100 polygons to make the full width of my mesh along one axis, it will change the triangle size. Most of the time changing the triangle size throughout the simulation will cause the mesh to pop between frames, so I set it pretty high to avoid that.

Motion Streak will stretch out the shape of the particles in the direction they are traveling, helping with motion blur. Mesh Smoothing iterations will also help to smooth out the mesh.

I prefer using Quad Mesh for the Mesh Method because it allows me to work with a lower poly mesh and then smooth the mesh using the 3 key. Also I make sure Velocity Per Vertex is checked because I plan on rendering with motion blur.

Then I throw some shaders onto my geometry, add some lights and a floor plane, and start rendering it out (**Fig.09 – 10**).



08

MIKE ZUGSCHWERT

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10

BUILDING DROIDS

Characters are of course a popular subject for CG artists. However in this series we will be approaching creating characters in a slightly different way. Each of our amazingly talented artists will be provided with a 2D concept and technical drawing of a cool, sci-fi droid. They will then show us how to turn this 2D information into an accurate and exciting 3D model. Many techniques and approaches will be used throughout the series which will provide all of us a great opportunity to develop our own 3D skills.

DEMOLITION DROID

Chapter 01 – Demolition Droid

Software used: 3ds Max

Introduction

This tutorial is about how to create a 3D model of a droid that has already been designed by a 2D artist. The droid concept was provided with some technical drawings from a few different angles (**Fig.01**). I used 3ds Max 2009 to create the complete model (these techniques can also be used with the latest versions of Max), V-Ray for the lighting, UVLayout for unwrapping the model and finally, for the textures, I used Photoshop CS4.

Creating the Base Mesh

I used the views provided as references inside Max, so I first went into Photoshop to break down each view into separate images. Back in Max I applied each image as a material to different planes, and placed them in order that they corresponded to the respective front, side and back views in the viewport. The first thing I made was the cab. I created a cube and placed it in X:0,0, at a very large size (**Fig.02**).

Working in large sizes gives you more freedom when you zoom in/out and it is easier to move in viewports. One thing I always do every time I make a new object is to right-click it, go to Object Properties and check the Backface Cull option. This option makes the polygons transparent when we see them from behind in See-Through Mode (Alt + X), making the work easier.

I converted the cube in Edit Poly to start the modeling. I deleted the front, top and back faces and made a couple of connections. I then moved some vertices, aligning them with the references, and made some bevels and chamfers. Finally I used the Shell modifier to make the thickness. I also started with a cube to make the top of the cab and the blast shield, always moving vertices around to match the references (**Fig.03**).

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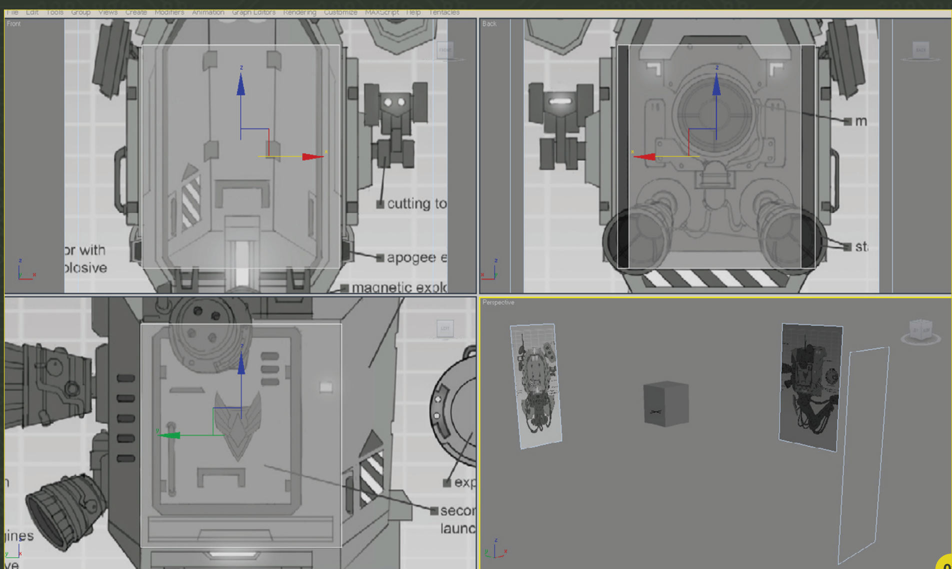

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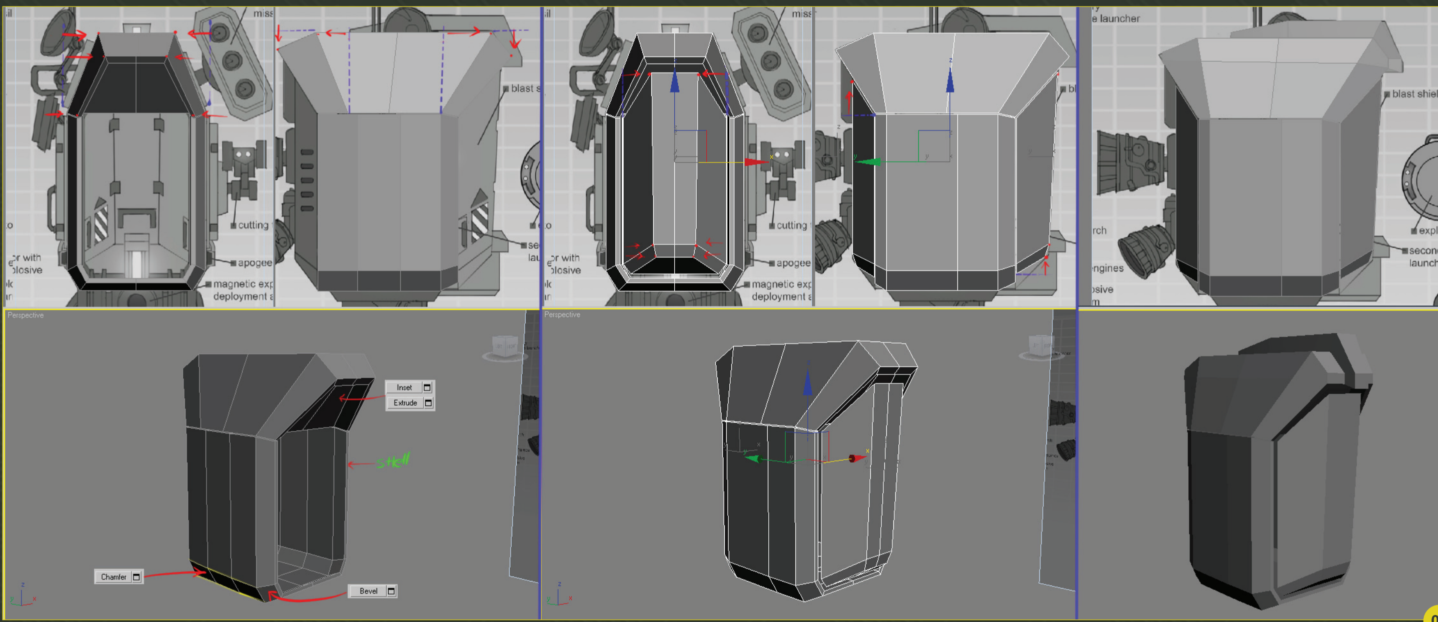

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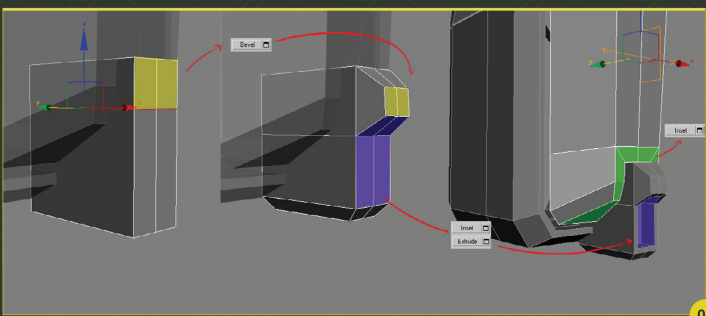

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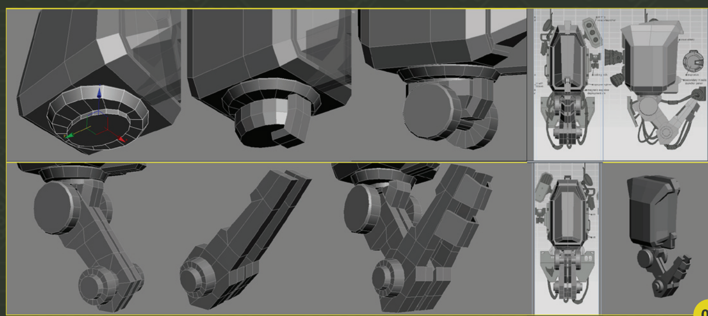
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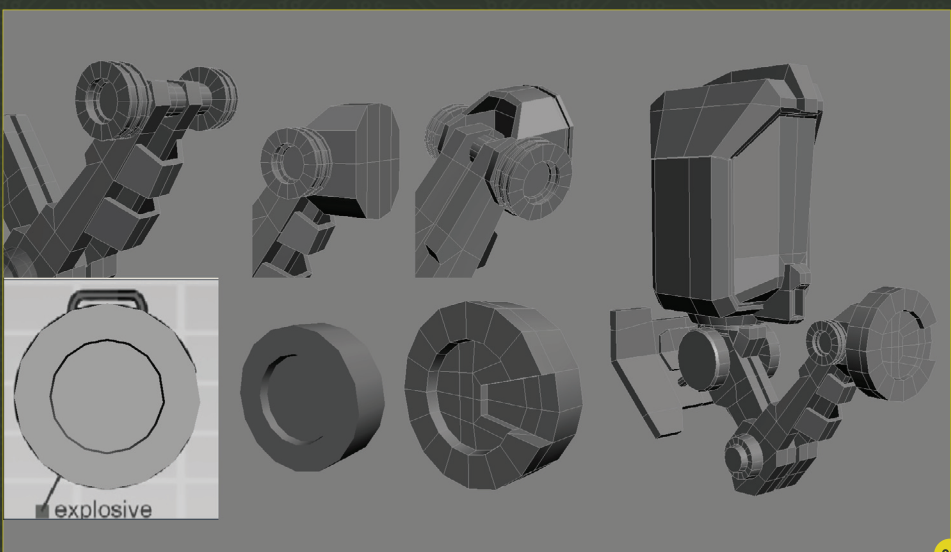
I proceeded to make the front light object, again starting with a cube. I made some connections and then selected two of the front faces and applied a bevel. I selected four of the resulting faces and applied an inset and then an extrude inwards to make the light socket. Back with the shield object, I selected the faces at the bottom, applied an inset and finally deleted the resulting faces. Note that I have deleted half of the model and applied a Symmetry modifier (**Fig.04**).

Generally when making base meshes I use the same methods of selecting polygons or edges and applying bevels, insets, extrudes, chamfers and connections. At the same time, I always move vertices here and there to keep things nice and tidy and to match the references (**Fig.05 – 06**).

At this stage I didn't spend time on any of the details since I was going to focus on them later. I only made the general shape of each of the objects, but paid attention to proportions and placed the object in the right place (**Fig.07**).



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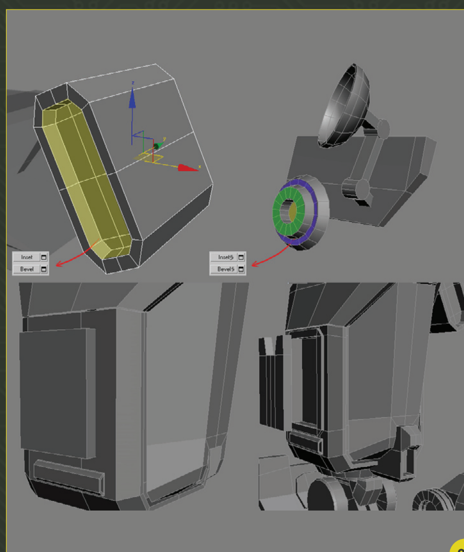
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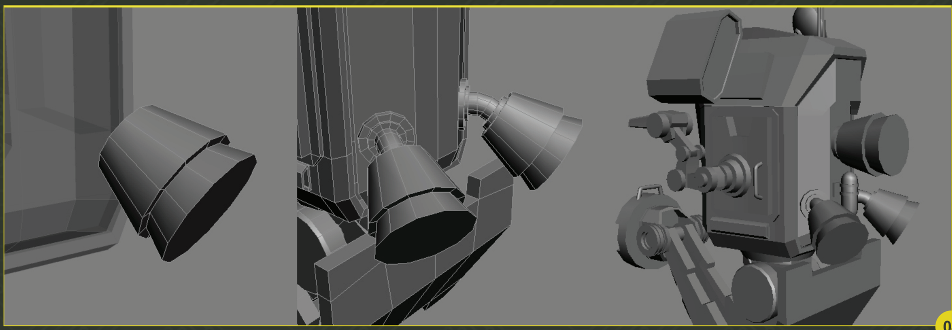
Note the simplicity of the satellite in the previous image; I made it using a semi-sphere with a Shell modifier, and some cylinders and rectangles simulating the arm. The same occurred with the thruster, stabilizers and cutting torch, as shown in **Fig.08**.

Once everything was done I started to make the cables. They are quite simple to do; I just created a spline, checked the Enable In Render and Enable In Viewport options inside the Rendering section and adjusted the Radial Thickness. After that I selected all the vertices, right-clicked them and checked Bezier. This action will give you the handles, which you can move in all directions (with Screen mode selected) to get the desired shape of the cable (**Fig.09**). At this point I had made the base mesh of the demolition droid.

Making the Detail

Having done the complete base mesh of the entire robot I started to make as many details as possible. The level of detail of any model will give it a level of realism. The more details a model has, the more realistic it will look. This is why it is important to collect lots of references and look at them in detail, trying to pick up on the small but important things that will make the model more realistic. For example, the intersection of objects is something I always try to avoid since it is completely unreal; I take two objects and place them one on top of the other, leaving a small gap between them. I also use lots of lines to divide pieces, as well as lots of extrusions, small holes, etc.

Now I am going to show the first piece I made, which was the back shield (**Fig.10**). I made extra connections and aligned some vertices. I then selected some polygons and made an inset-extrude, resulting in the holes we can see in the concept. I also selected some loops of edges and applied an extrude, and aligned some vertices again. By this point I was at D in Fig.10. The shield looked more defined at this point, but the edges seemed too sharp, so I needed to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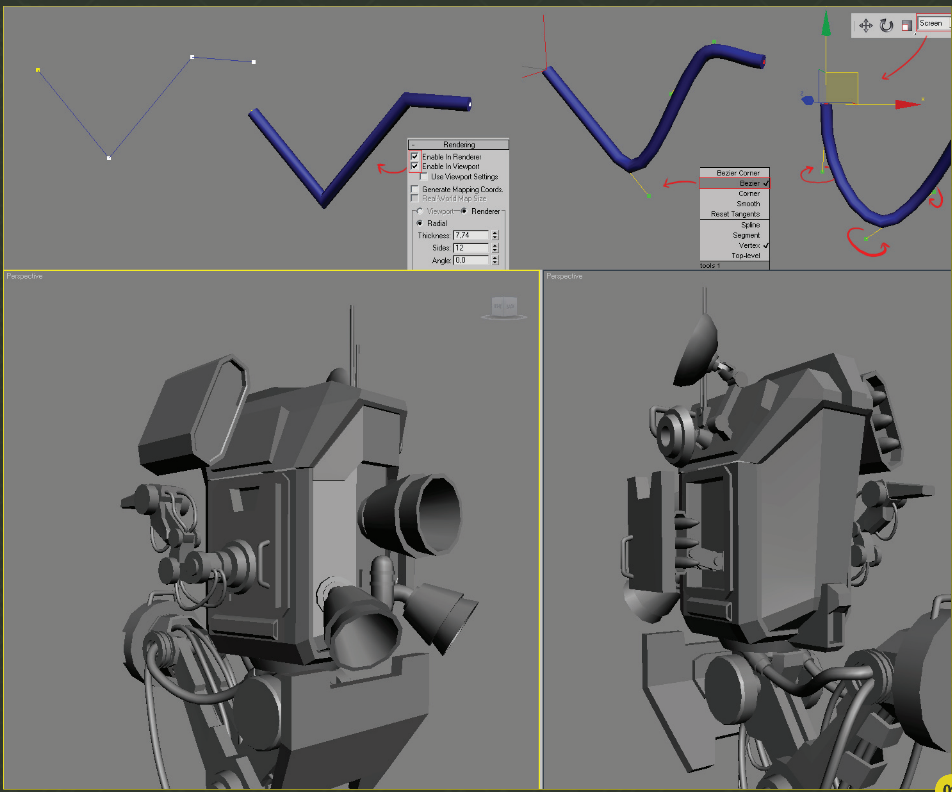

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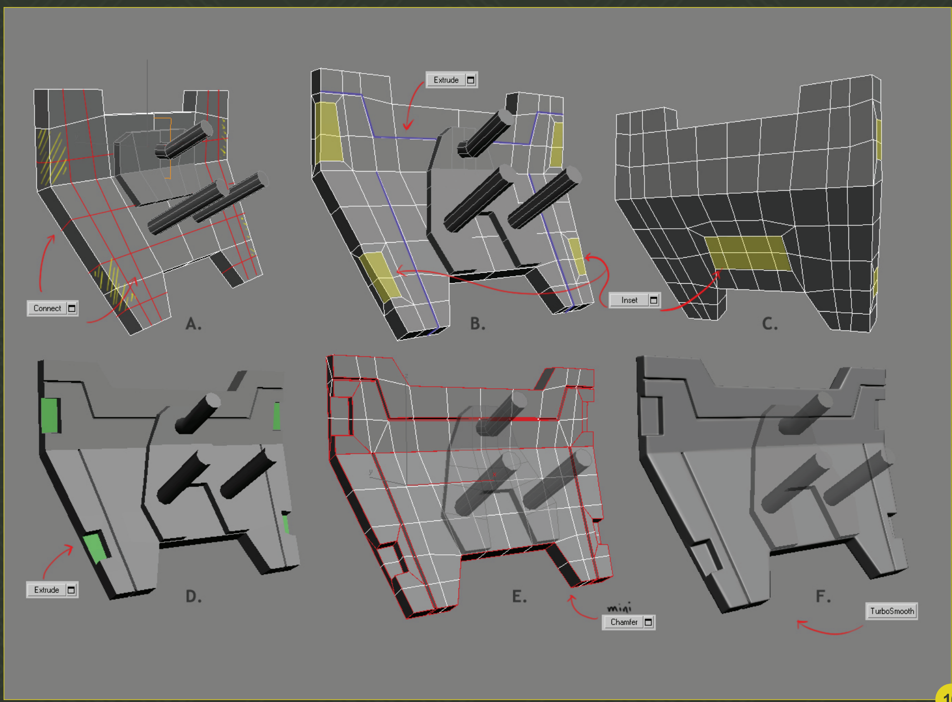

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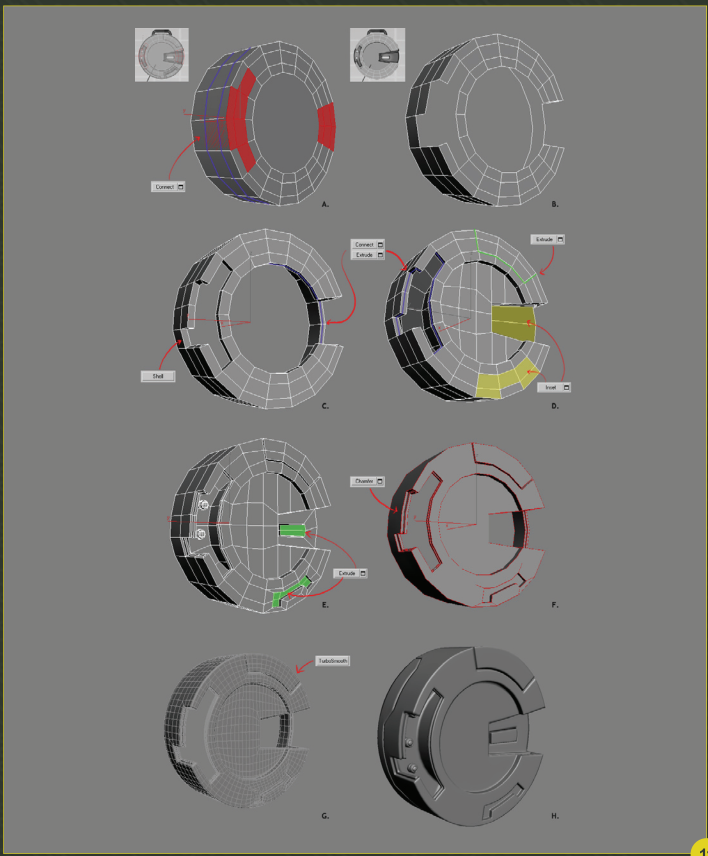

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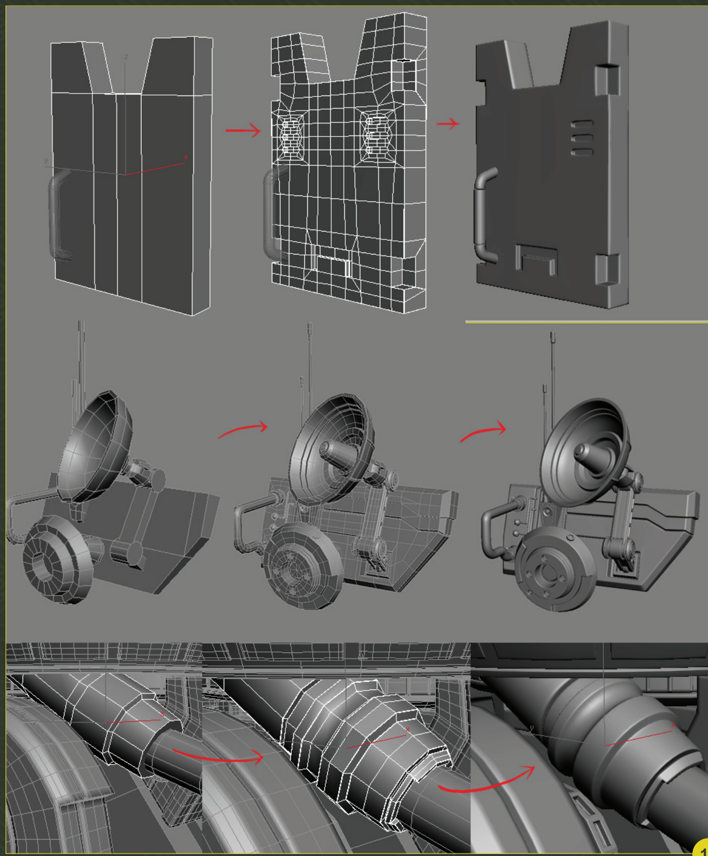

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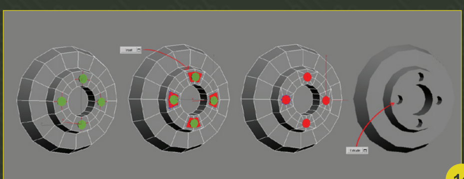
select all the edges I wanted to smooth as and make a mini chamfer. I usually use a value of 0.1, but it will depend on the size of the object. After that I had to clean lots of vertices and make things tidy to finally apply a TurboSmooth modifier.

One of the more attractive pieces to create was the explosive (**Fig.11**). I started with a cylinder, made an inset and some connections and then selected some polygons and deleted them to make the holes. Once I had applied the Shell modifier to create the thickness I created new geometry to make the inside body of the explosive, shown as dark gray in Fig.11 image D. I proceeded to select the loop of the edges I wanted to extrude and the same with some polygons. The final step was always selecting the necessary edges to apply the mini chamfer and finally the TurboSmooth modifier to.



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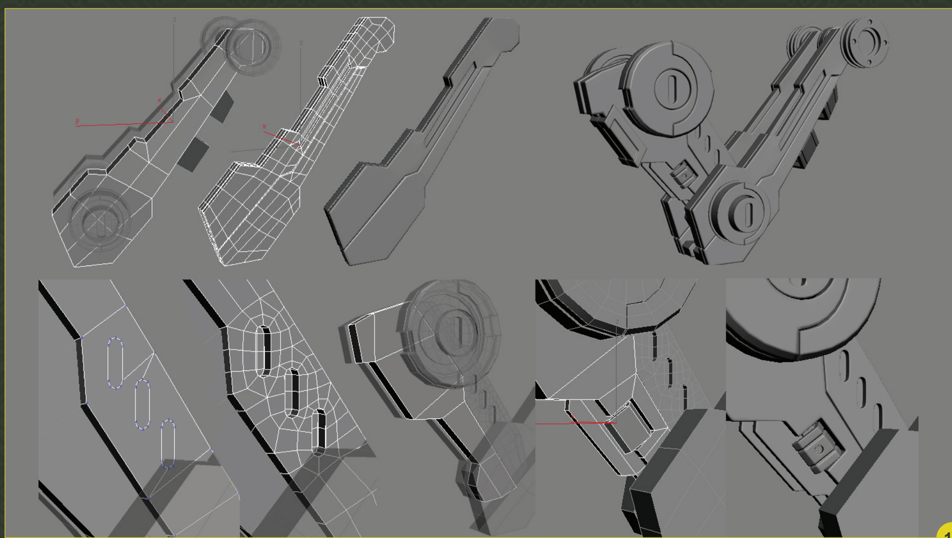

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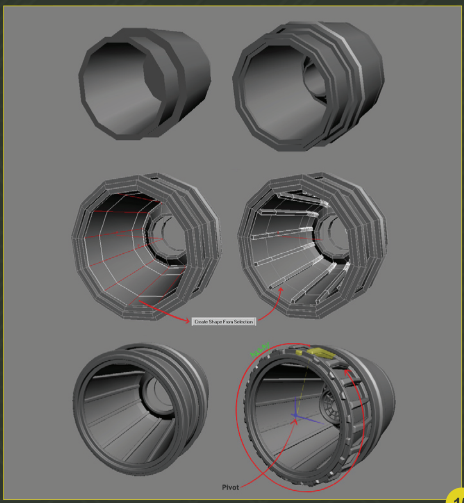
All these methods and techniques were applied to all the pieces; you can see more examples in **Fig.12 – 13**. I always tried to follow the concept as much as possible. I made all the details I saw in the drawing, but also added a little more in those areas where I didn't see too much definition, like in the satellite area or in the secondary missile launcher panel section.

To finish this section I would like to share some tricks I used in specific situations. To make holes it is always a good idea to look for a cross of edges and place cylinders as a reference with the number of faces you would like the hole to have; eight in my case. After that it is just about selecting the respective polygons, making an inset, arraying the vertices to fix the cylinder and extruding inwards (**Fig.14**).

The thrusters needed some ribs inside them so I selected the loop of edges and in the Edit Edge options I used the button called Create



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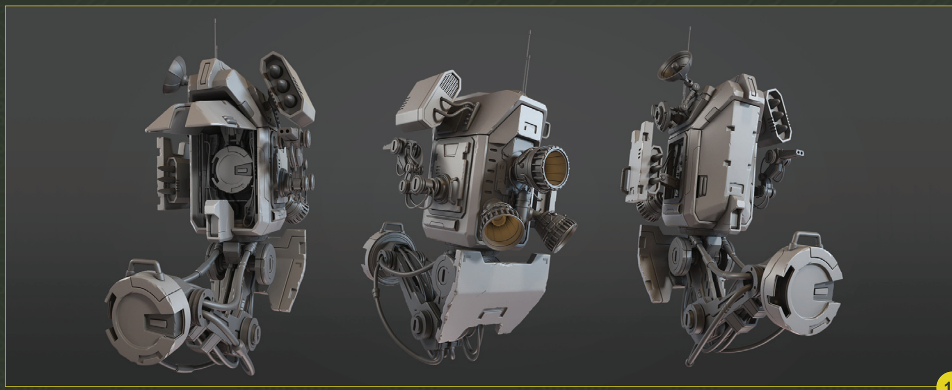

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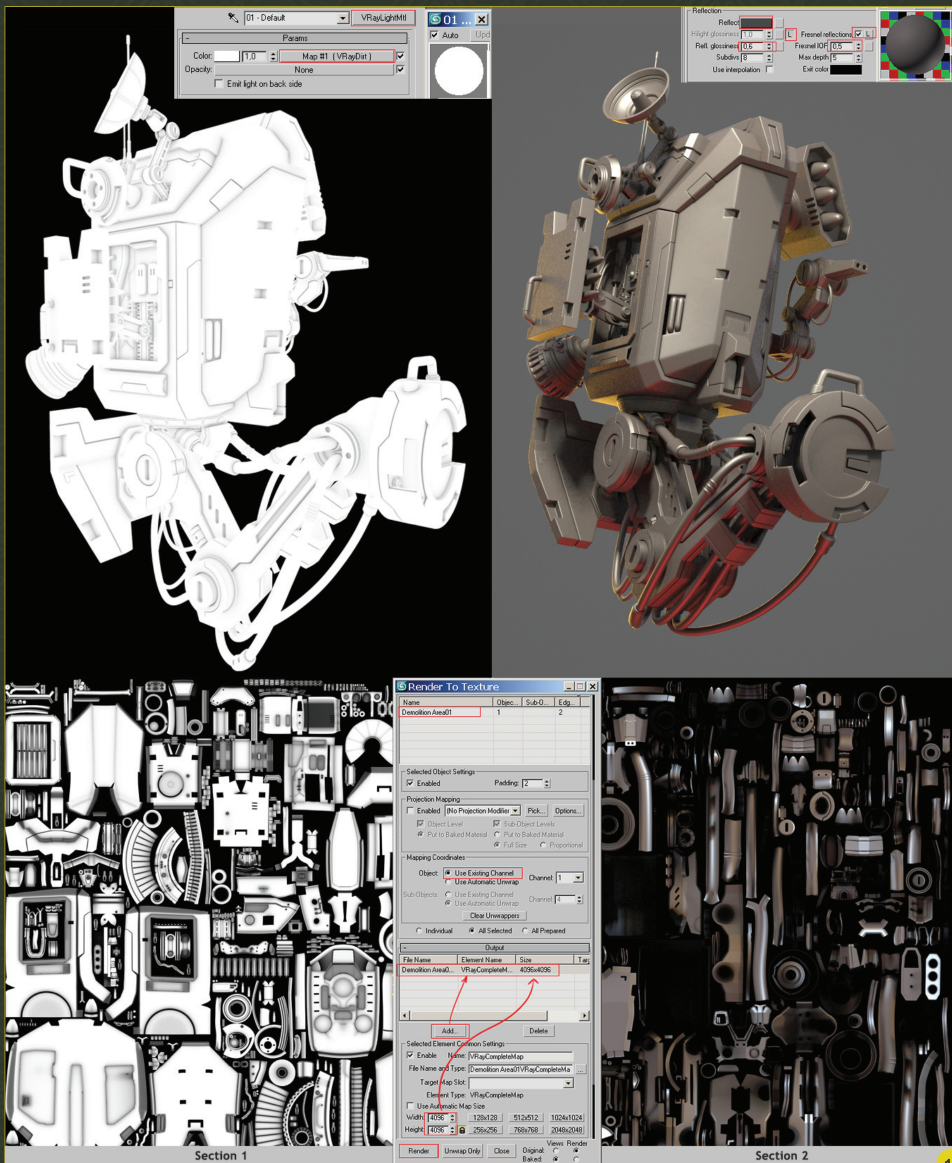

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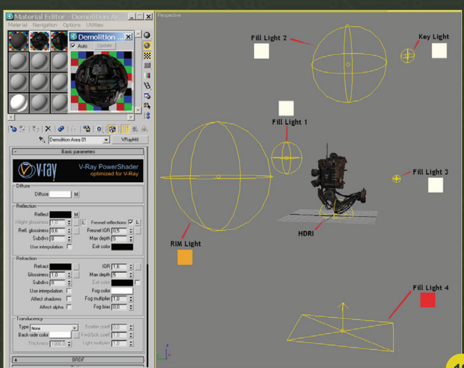
Shape From Selection to create a spline in the place where the selected edges are. These new shapes can be edited and modified. I also created an extra object outside the propellant, which I copied thanks to the Array tool under the Tools menu (**Fig.15**).

Having the droid completely finished with full details, I unwrapped the model using UVLayout and then went into ZBrush to add some damage with the Mallet Fast brush. Here is a clay render where you can see the final result (**Fig.16**).

Textures

I divided the model into two sections, each with 4096 x 4096 maps. Before painting the textures in Photoshop I started by baking the Ambient Occlusion (AO) maps. The first one was created with a VRayLightMtl and into the Color map I added a VRayDirt map and then played with the Radius and Falloff values inside the VRayDirt parameters until I got the result I wanted. The second one was an extra AO map that I always use to give more realism to my textures. I



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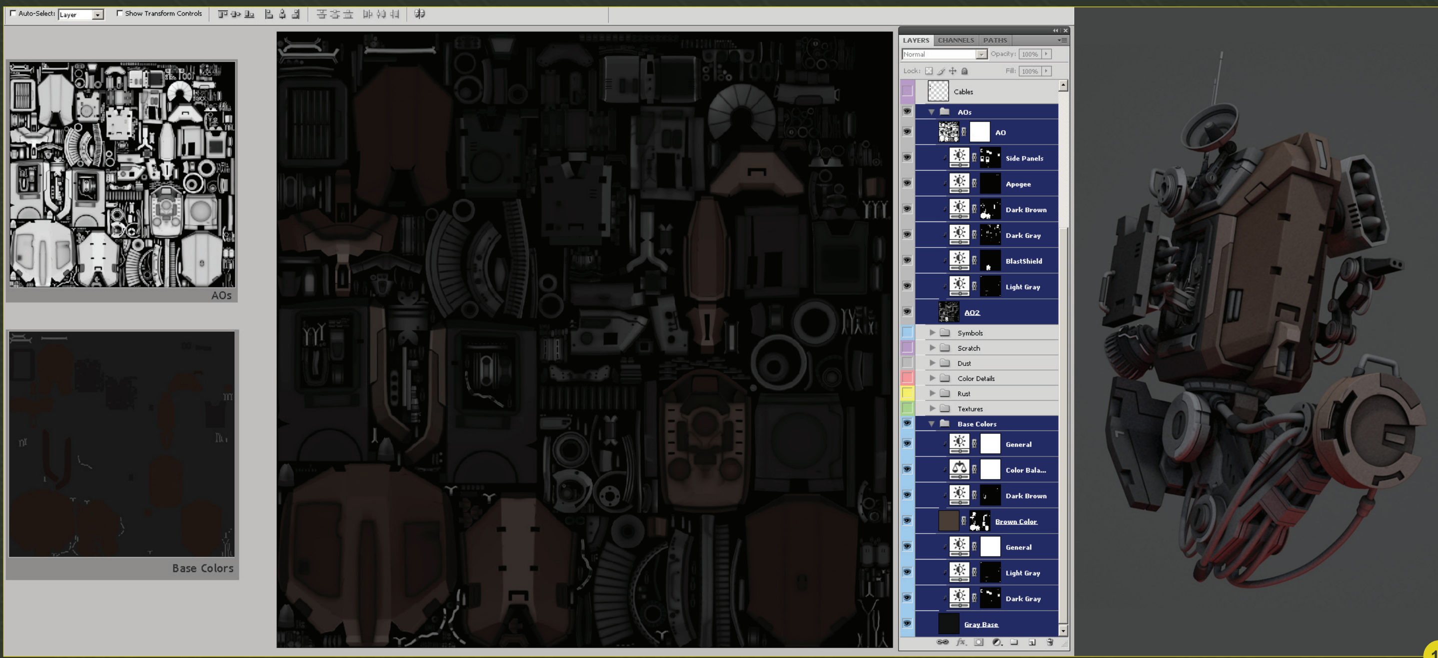
achieved this by creating a simple illumination set and applying a basic shader to the model. Both were baked out using the Bake To Texture option (**Fig.17**).

To begin the texturing process I needed an illumination set specially created for this droid (**Fig.18**). It was an HDRI dome light for the ambient illumination, one key light, some fill lights and one rim light. In the image I also show the reflection parameters used on the model. The lighting setup was courtesy of Eduardo Balestrini.



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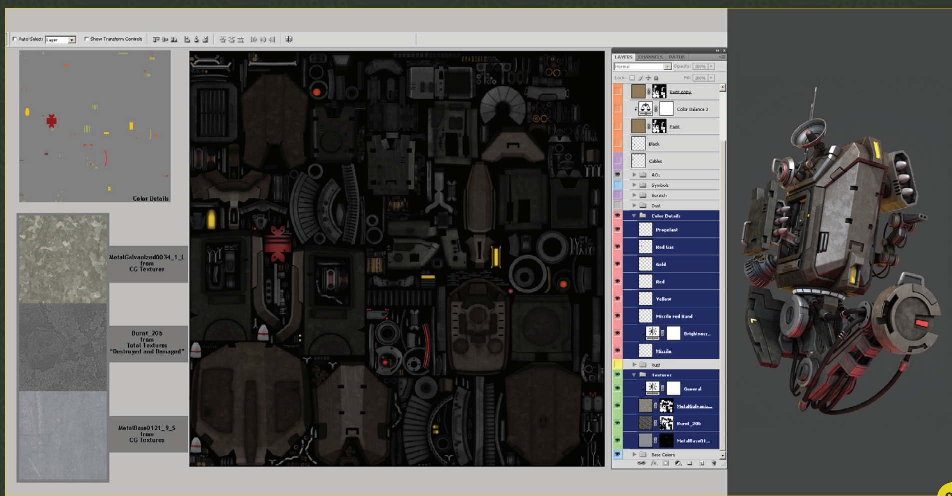
The first step in Photoshop was to add the first AO map in Multiply blending mode and at 100% opacity, and the second AO in Normal blending mode at 20% opacity. Under this folder I created the base color, which was gray, and over it I masked the brown areas. I added lots of brightness/contrast adjustments to get darker or lighter areas (**Fig.19**). Between these two I created the rest of the folders.



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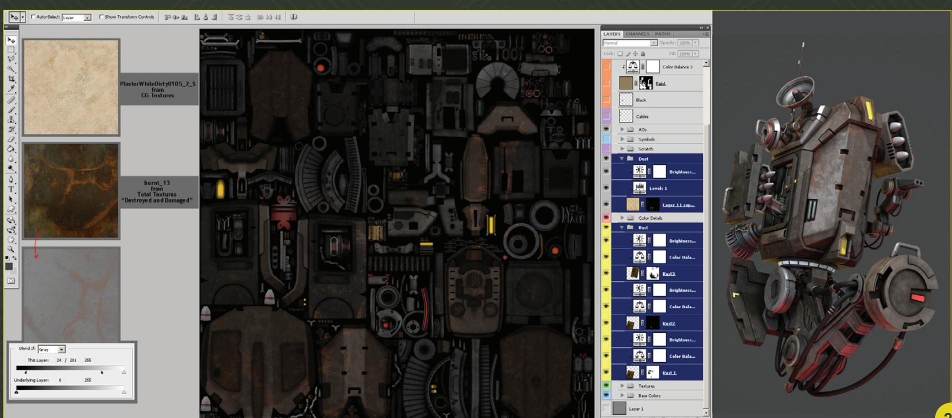
After that I added some photo textures to give it a true metallic feeling. The first one was MetalGalvanized0034_1_L from CGTextures.com. I copied it all around the canvas and changed the blend mode to Lighter Color and 20% opacity, in which I masked only the brown areas. For the gray areas I made the specific mask using the Burnt_20b texture from the Total Textures: V19 – Destroyed & Damaged DVD in Luminosity blend mode. I set it to 25% opacity and applied some contrast adjustments to make the texture more believable (**Fig.20**). All the textures were done in a similar way. I also painted in the diverse colors, like the yellow lights, in different layers. The same was done with the white missiles, etc. From this render I also created the Specular map, which I will explain later.



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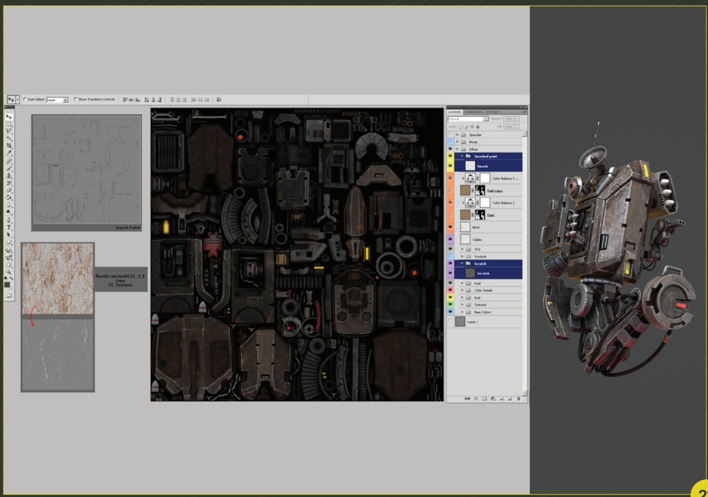
Having done the metallic base I continued to add some dust (in the areas where dust would probably accumulate) using the PlasterWhiteDirty0105_2_S image from CGTexture.com in Multiply mode at 78% opacity. I also added some rust using the burnt_13 image from the Total Textures: V19 – Destroyed & Damaged DVD in Linear Dodge blend mode (**Fig.21**). I always like to add lots of damage to the metallic models, like dust, rust and scratches, because this way the metal looks more real and even more if the droid is in the middle of a battle.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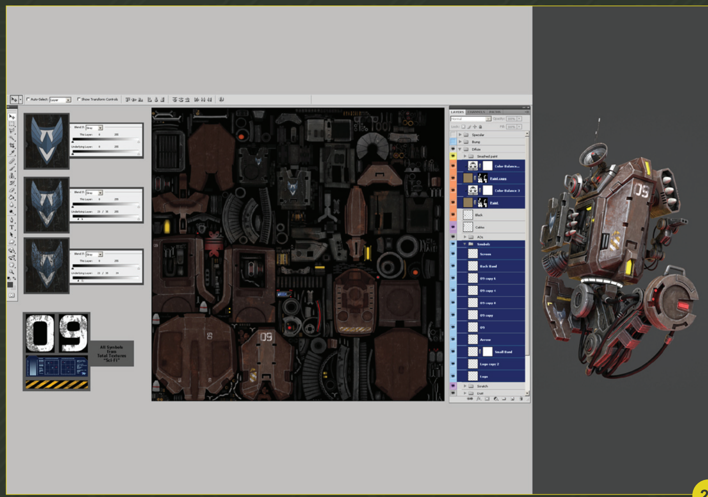
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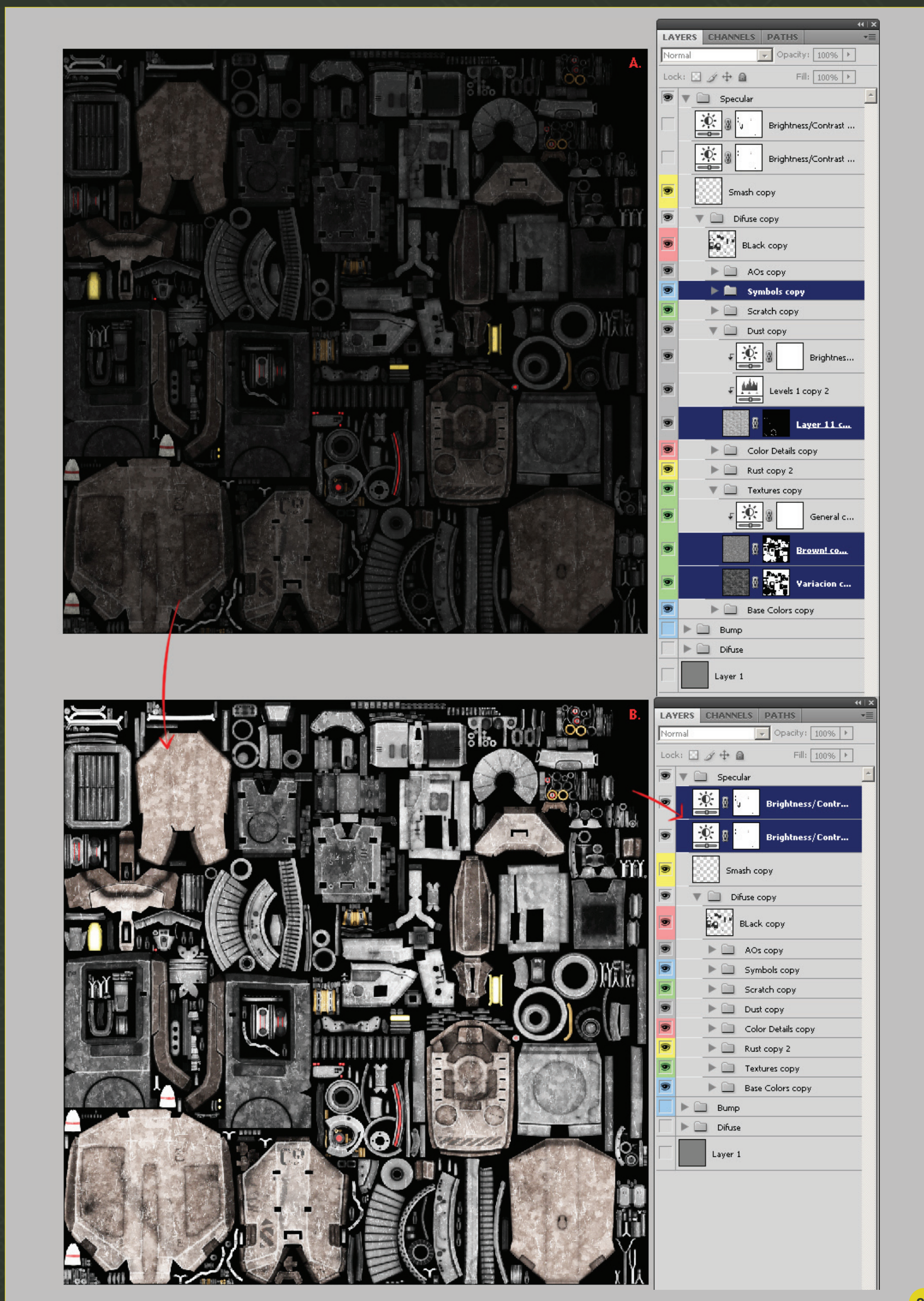
At this point I still saw the robot as too clean. Scratches and smashes are things that can never be missed. For the scratches I used RustScratches0033_3_S from CGTextures.com in Exclusion blend mode and at 20% opacity. I also applied lots of modifications to the map, like inverting the color, desaturating it and changing contrast. For the smashes I just painted in an empty layer with light gray in the areas I thought the metal would smash (**Fig.22**).

Now the droid was almost done; it just needed logos, symbols and numbers all around him. The trick I used to integrate symbols into the texture was to adjust the blending mode of the layers. Moving the white arrow will fade away the lightest areas of the layers beneath it into the actual layer, and moving the black arrow will fade away the darkest areas (**Fig.23**). I also included an extra layer to change the color of the brown areas a little bit.

Having completed the Diffuse map I copied the entire folder and made some adjustments to turn it into the Specular map. I first desaturated all the textures maps, then made some adjustments to the brightness and contrast (**Fig.24**), and finally added two general brightness adjustments on top of everything to let the metal shine.

To conclude the texturing process I took the smash layer from the diffuse and copied it, generating a Bump map. This helped to create



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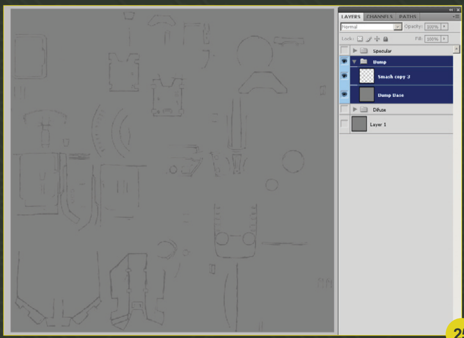

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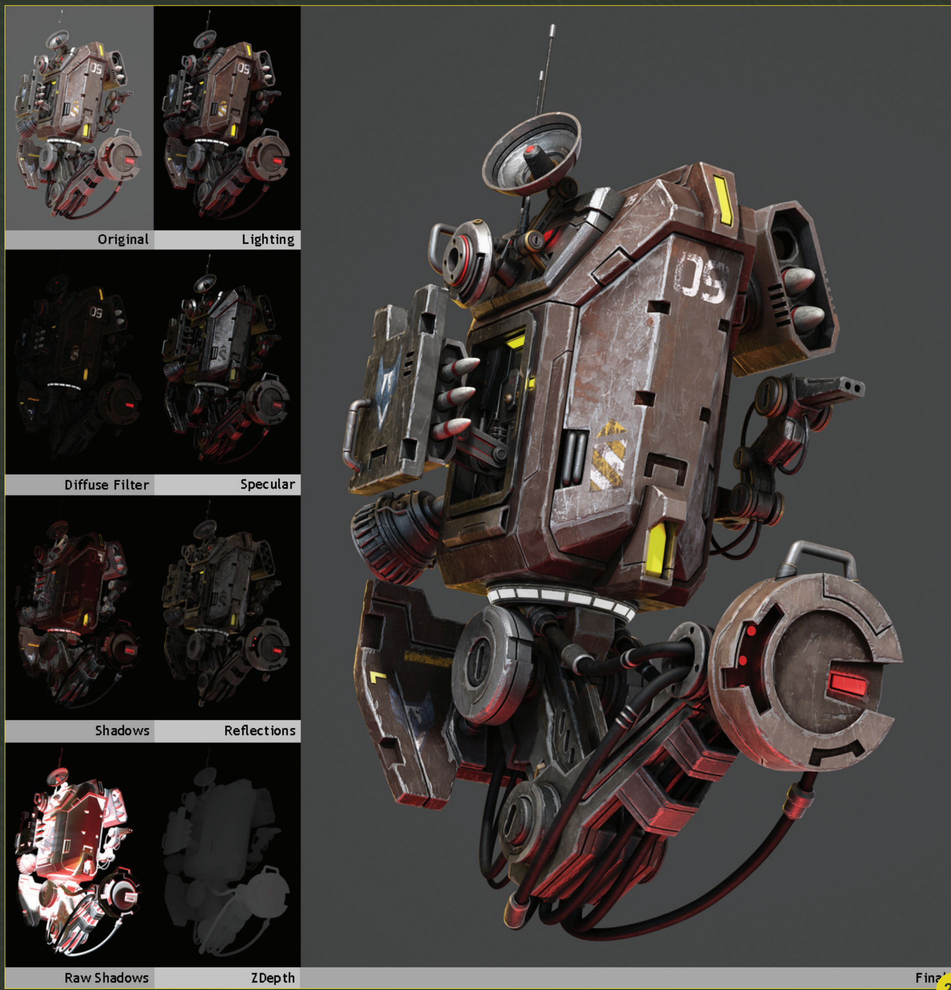
the sense of thickness when the paint peeled away, revealing the metal underneath (**Fig.25**).

Post-production

To conclude the project, I rendered out the passes shown in **Fig.26** and post-produced them in Photoshop, playing with different blending modes and adjustments until I got the desired result. The background was made in Photoshop using images like clouds, smokes, laser shots from the Total Textures V07:R2 – Sci-Fi DVD and a little hand painting as well.

Conclusion

There are no specific rules on how to make things. Once you know how to use the different programs you can use your skills along with your creativity, always trying to improve your methods and discovering new tricks. I hope this tutorial has offered you some useful tips (**Fig.27 – 28**).



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VICTORIA PASSARIELLO

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ARMORED BEASTS

ZBrush is a formidable piece of software that is capable of so much. The possibilities are endless and the only restriction is your imagination. In this series our artists will be flexing their creative muscles to show us how to create not only the organic forms of their beasts, but also the non-organic forms that make up their armor and weaponry. Follow the creation process from initial concept through to final illustration and find out how to create some mind-blowing armored beasts!

JANUARY ISSUE 077 Chapter 01 | Lizard FEBRUARY ISSUE 078 Chapter 02 | Bear MARCH ISSUE 079 Chapter 03 | Chicken
THIS ISSUE Chapter 04 | Gorilla NEXT ISSUE Chapter 05 | Cat JUNE ISSUE 082 Chapter 06 | Rhino

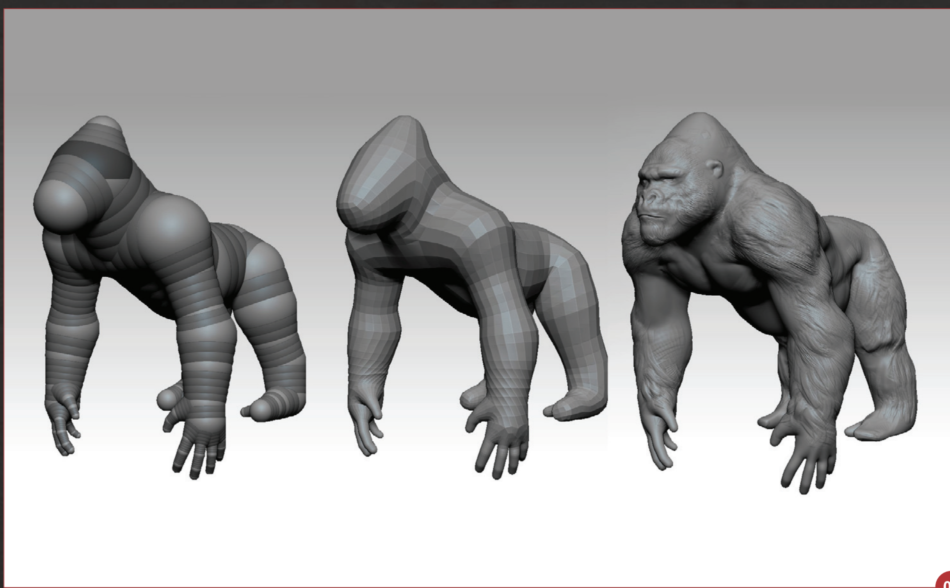
CHAPTER 04 – GORILLA

Software used: ZBrush

When I took on this task, for some reason I was thinking about the polar bear from *The Golden Compass* movie. For that reason I thought I could use golden armor on the gray gorilla to make it pop-out and shine a bit more. I also thought that I would use the armor of the Mayans and Aztecs to add to the jungle feeling. A lot of 3D artists might struggle to create their own 2D concepts, so what I have done is to demonstrate a technique that I find helpful in **Fig.01**. You can gather photos of your subject matter and paint over them in Photoshop to design your armor. It helps to start looking at references at the start of a project anyway.

To create these concepts I painted simple shapes using flat color over the photo. Once I had done this I added a little detail and shading by painting over the shape of the armor using the Burn and Dodge tools, making sure I maintained sharp edges. The final touch was to add some of the red crystals and other details.

01



02

03

When I was satisfied with the concept I decided to move on to the next stage and began working in 3D. My process from this point was very common and is used as standard by many ZBrush artists. I began by using ZSpheres to create the basic structure and proportions of the gorilla. After I had done this I applied DynaMesh, which meant that I had a base model consisting of polygons of equal sides and dimensions. It was then just a case of adding detail using the Clay Buildup brush (**Fig.02**).

I like working with this brush because you can achieve a variety of details using it, from rough and big forms to smaller details. After making the basic forms I started modeling the hair with the Weave 1 brush, with which I was able to play with the direction of the hair's flow (**Fig.03**).

04

After piling on the detail, I started to think about the final model. I knew there would be some parts where you wouldn't be able to see the gorilla because of the armor and therefore these parts wouldn't require as much detail (**Fig.04**).

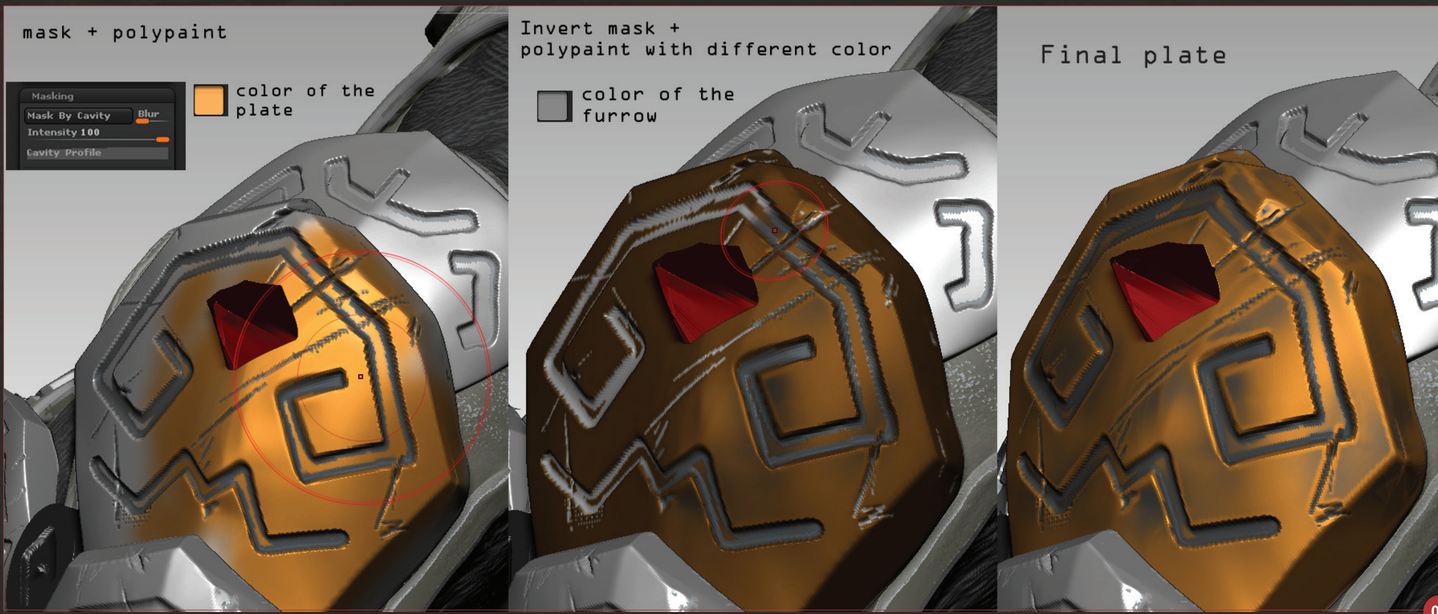
The next step was to create and add the armor to the gorilla. I did this by creating simple subtools by masking and extracting sections from the gorilla model (**Fig.05**). I started by looking for flat areas on the gorilla's body that would be suitable to extract from. I then masked the area by pressing Ctrl and drawing on the model. After I had done this I went to the Subtool menu and chose Extract. This helped to extrude the geometry, but at this point it was all wavy and not how I wanted it. To turn these areas into a flat hard surface I used brushes like the sPolish brush. After I had done this I used the ClipCurve brush, pressed Ctrl + Shift to activate it and started stretching the lines and forms to make the armor more precise.

When I was happy with how things were turning out I started detailing the armor using a mask. To create the groove detail I created masks and used the Inflate option with a negative value to create a dip in the armor's surface. The final step was to add some scratches and areas where the armor had been dented and damaged in battle. I did this using the DamStandard and the TrimDynamic brushes.

After finishing the model of the gorilla I started choosing and applying materials to separate the armor pieces from one another. I used standard materials in ZBrush. You can see which materials are attached to which parts in **Fig.06**.

05

06



07

After organizing the materials I decided to add flat color to the model, as I didn't want to make any textures at this moment. It was something that I was going to do in the final image.

In **Fig.07** you can see how I painted the details on the armor by using masks. I used the cavity masking option in the Masks menu to help with this. I started by adding the main color, which was pretty close to the color in my concept. I then inverted my mask and added the color for the tarnished metal. To do this I used a gray-like color. Using this same technique I added color to the rest of the image.

At this stage I was happy with how things were going with the color and the materials, so the next step was to put the gorilla in a pose that would look good in the final image. This model is made from a lot of different subtools, which can make posing difficult. I used the Transpose Master to put the gorilla in the pose I wanted. This way I was able to move the model into position when all the subtools were in their lowest subdivision level. After I was finished with the posing I went to Transpose Master > TPose > SubT to see the model with all of its subtools.

When I was happy with everything I started to think of a good viewpoint and angle to view the model from for my final image (**Fig.08**). It

08

helped to visualize what I wanted at this point, as I could then work out all of my future steps. I noticed that I needed to make the gorilla's weapon and so did that using the same process I described earlier (**Fig.09**).

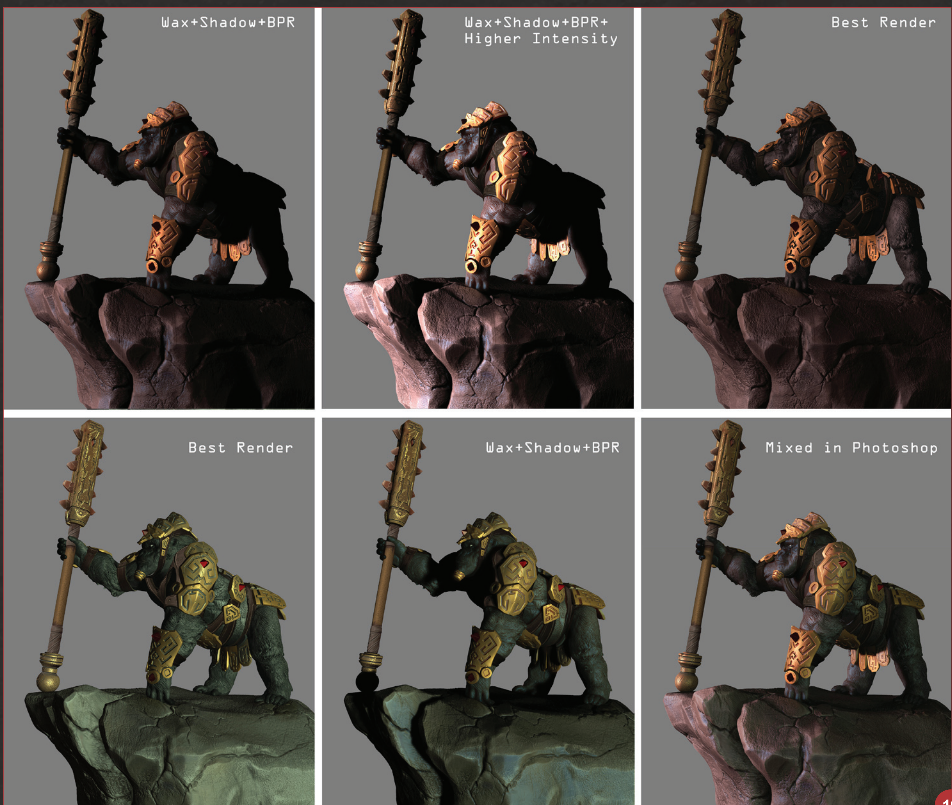
At this point, I had decided on the camera angle and what would be in the background of my image. I knew that I wanted him standing on a rock in front of a dense forest. I also wanted the sun to be setting in the background to make the environment look more dramatic. With this in mind I could start to work on the final render.

I used one standard light and wax rendering with the BPR and Shadow on. I wanted sharp black shadows to be cast because of the strong light, but I knew I could achieve this by playing with opacities later on in Photoshop (**Fig.10**). I also used one bright red/pink front light, with and without shadow, and one green side light just to use it as bouncing light that reflects the colors of the jungle. In Fig.10 you can also see all of these layers and lights mixed in Photoshop.

In **Fig.11** you can see the rest of the work I did in Photoshop. I added the background in three steps. In the first step I added some of the background color using some of the colors that I had used in the lights to tie everything together. To do this I used soft brushes.

09

The next step was to turn my attention to the gorilla by adding to his fur and making him look a little more realistic. To do this I used a Smudge brush made of lots of dots to look like individual hairs. I also added a few more specular highlights to the armor using a brush in Dodge mode. In the foreground I added some leaves and foliage to add more depth, and used some photos to start to create the background.



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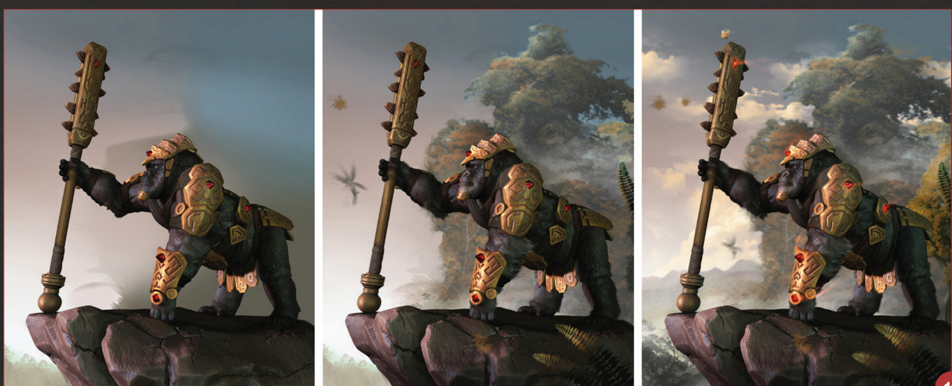

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The final step was to add some clouds and mountains to the background to demonstrate the type of environment these gorillas would live in. I added a little glow to the crystals on the gorilla's armor and darkened the rock that he is standing on to turn the viewer's attention to the character more than its environment.

For the final image I decided to draw the viewer's attention to the main character by decreasing detail in certain areas. I added some texture overlays to the rock in the foreground and added some subtle, thin clouds to the space between the gorilla and the trees. The final step was a few color adjustments to make the image a little warmer and then it was done.

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CHARACTER PRODUCTION

Over the last couple of years modeling realistic 3D heads and busts has become really popular. In this series we will be shown how to do this using 3ds Max, Maya and ZBrush. From the basic head model and a highly detailed head sculpt, through to texturing and post-production, our artists will cover every aspect of the creation process, providing us with the perfect opportunity to learn from their experience.

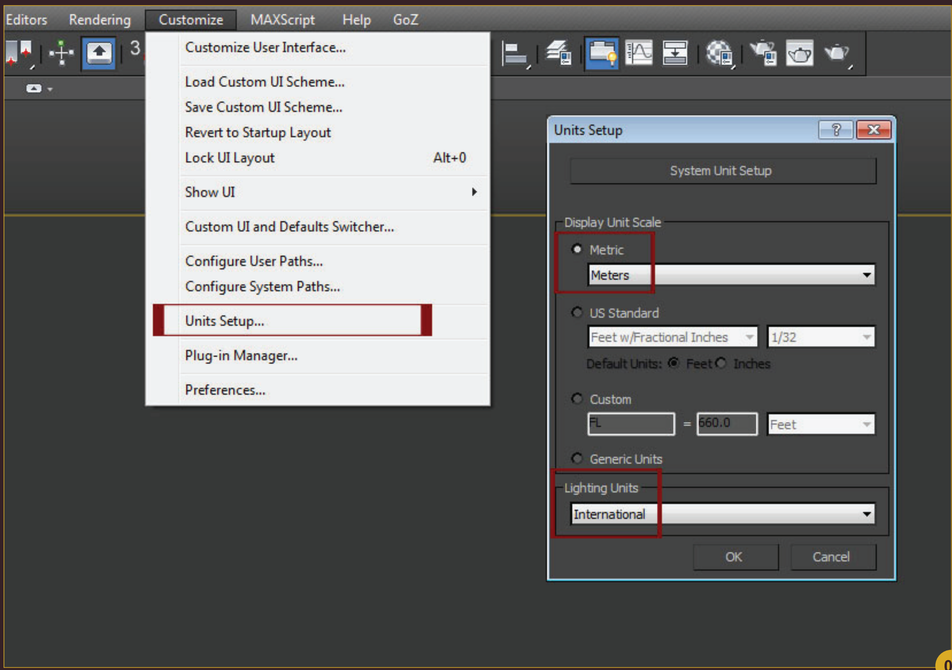
Chapter 01 – Low Poly Modeling

Software used: 3ds Max

The first thing you need to do before starting a project is to have an idea. It doesn't need to be precise from the start and you don't need to have the whole process planned out from the beginning, but you need at least the general direction. In this case I want to do an old musician (old, but still rocking) with a cool attitude. The next step is to gather references to refine the idea and start planning what it is I want to make.

I start by looking at pictures of the Rolling Stones, Ozzy Osbourne, ACDC and then Bruce Springsteen. I'm going to use all of these musical icons as references for this project. The goal is not to recreate any of these characters, but to try to capture their cool and relaxed feel. I also want to create a funny mouth shape and show my old man blowing out smoke, so I gather references to help create that look as well.

The next step is to create the base head to work on. Sometimes I create a very rough head model in ZBrush, which I then sculpt from a cube. When I do this I focus on creating the main features like the eyes, nose and ears etc. I don't add any detail at this point, but take it into 3ds Max and then rebuild the topology using the Polydraw option. Sometimes I just like to start from one of my existing models to save some time. For this model though, I want to build a new, clean base head model with some nice edge loops and make it my new base head model for all my future projects.



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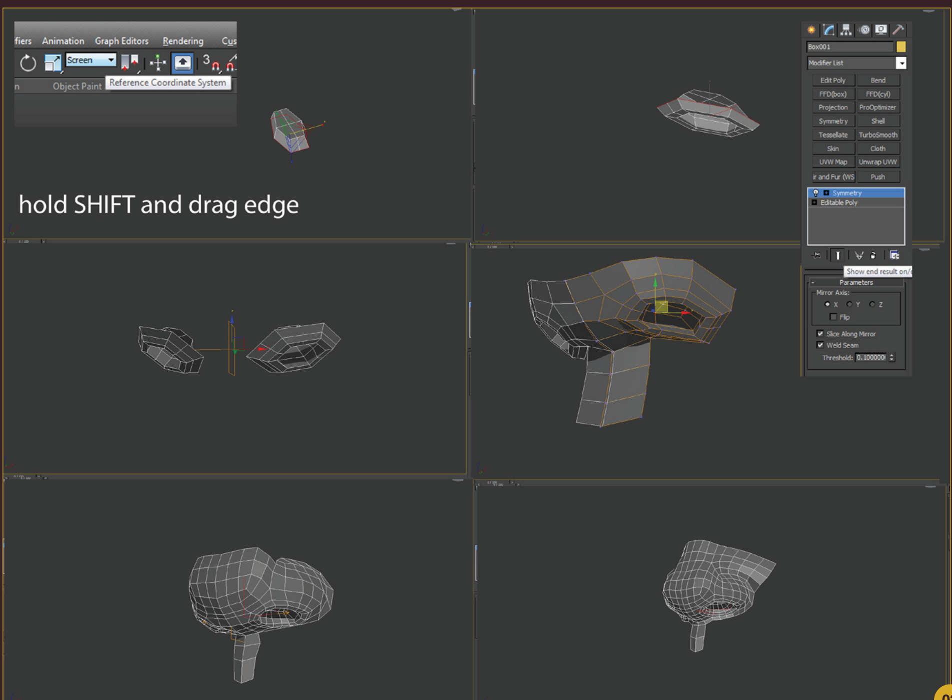
Before you start working in 3ds Max it's good to adjust your Units setting (**Fig.01**). Go to Customize > Units Setup and select Metric for the Display Unit Scale and International for the Lighting Units.

When I model a head in 3ds Max I just focus on the topology of every part (eyes, nose, etc.,). I don't really concern myself with the overall look of the head, because once the model is done and I'm happy with the edge flow, I know that I will be able to bring that model into ZBrush and deform it the way I want more quickly than I could do it in 3ds Max. It's just something I like to do.



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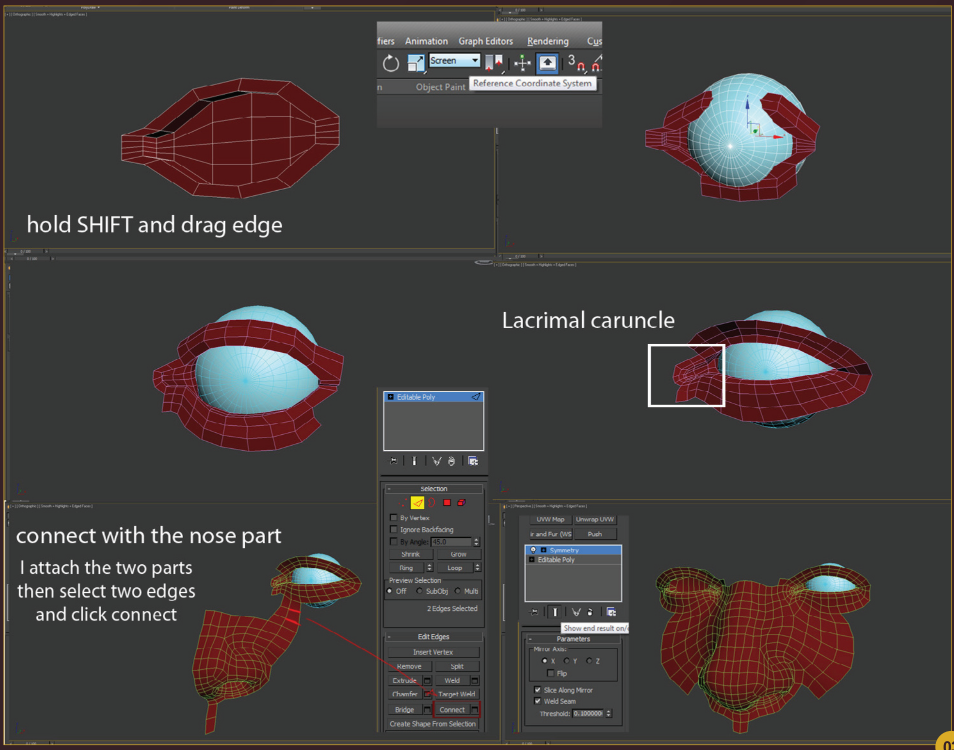
I like to model the head by starting on the inside of the different parts. For example, when modeling the nose I start modeling the inside of the nostril and then expand the geometry out (**Fig.02**). To do this I change my Reference Coordinate System to Screen so I can now move stuff around based on what I see on the screen. Then I select one or multiple edges and extrude them by holding Shift and dragging them where I want to have them. I apply a Symmetry modifier with the Show End Result feature on so I can see the other side of the nose.

Once I have the basic shape of the nose I start doing the same thing for the eyes. I start with a very basic shape made from a plane (using Cut tools) and extrude the edges the same way as I did it for the nose. Then I very quickly place a sphere in it to be sure the eyelids will wrap around the eye ball (**Fig.03**).

As I model the eye I add more definition to the lacrimal caruncle, which is the pink part on the inside of the eye (you can see this in the corner of the eye). Two things that are very important to keep in mind when modeling an eye are that the eyelids are very thick and the pink part has to follow the eye movement. A common mistake that we all make is to make the eyelid very thin when in fact they are quite thick. Even if your model is the best model ever, if the eyelids are too thin there will always be something weird



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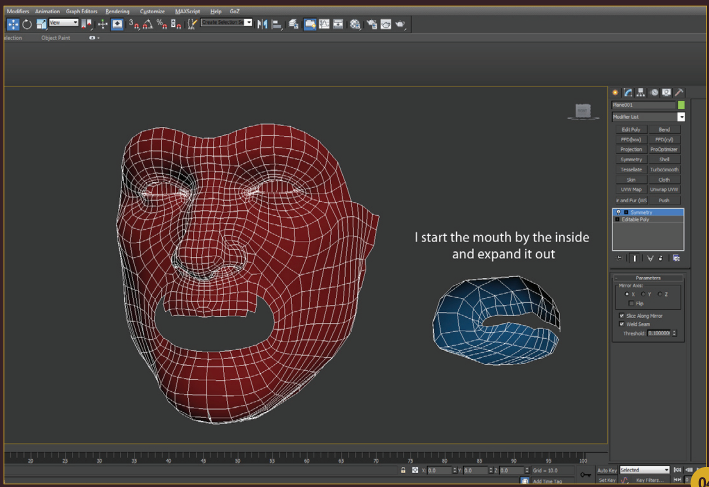

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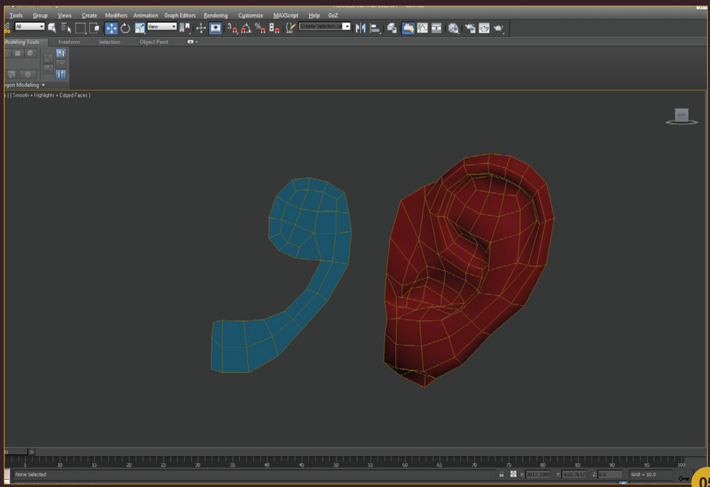
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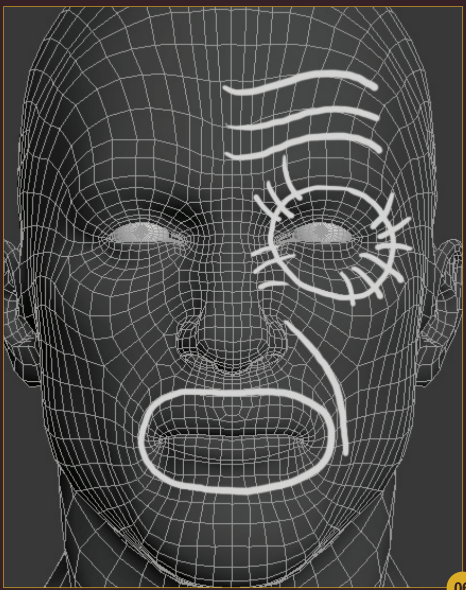
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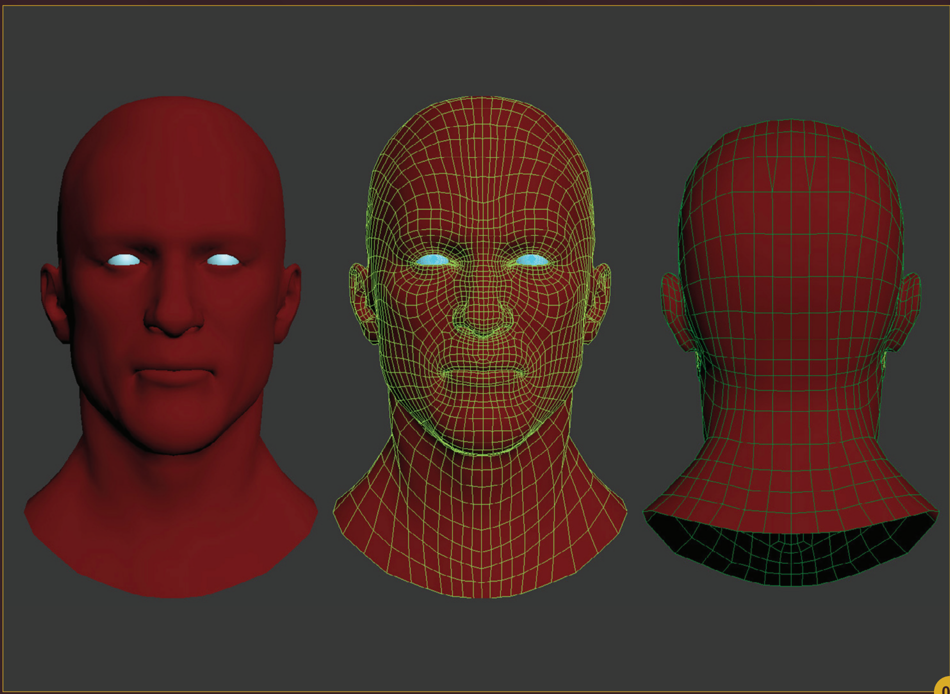
about the eyes of your character. Having them thick will help the overall appearance and will give more space for the specular/reflection etc.

Once the base of my eye is done I start connecting it to the nose, while trying to keep the flow of the face muscles. For the mouth, I again start modeling it from the inside (**Fig.04**).

For the ear I do things a little differently. I start by using a plane, but instead of expanding it from the external auditory canal (hole), I instead create a rough shape for the antihelix and, as I did previously, I extrude edges by holding Shift and pushing the vertices in and out (**Fig.05**).

Since all the wrinkles and other skin marks on the face are the result of the face muscles deforming the skin, you want to have edge loops that will give you a nice topology for when you sculpt. Even if this will end up being a still picture, I still want to have a model that I could animate or apply different expressions to, and I want the edge loops to provide me with this possibility (**Fig.06**).

The final result is a very simple and basic head model with no particular expression, and that is exactly what I want since I can now bring it into ZBrush and start shaping it the way I want (**Fig.07**).



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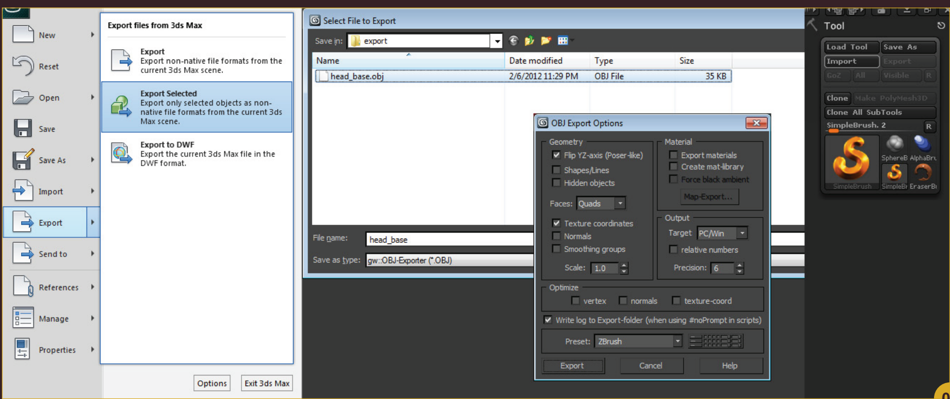

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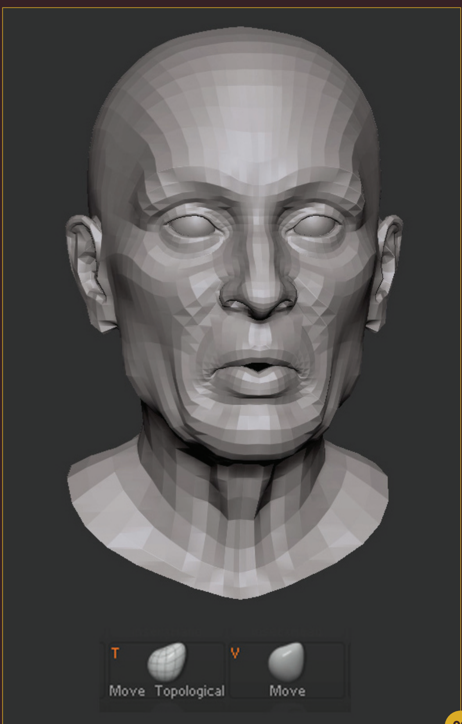

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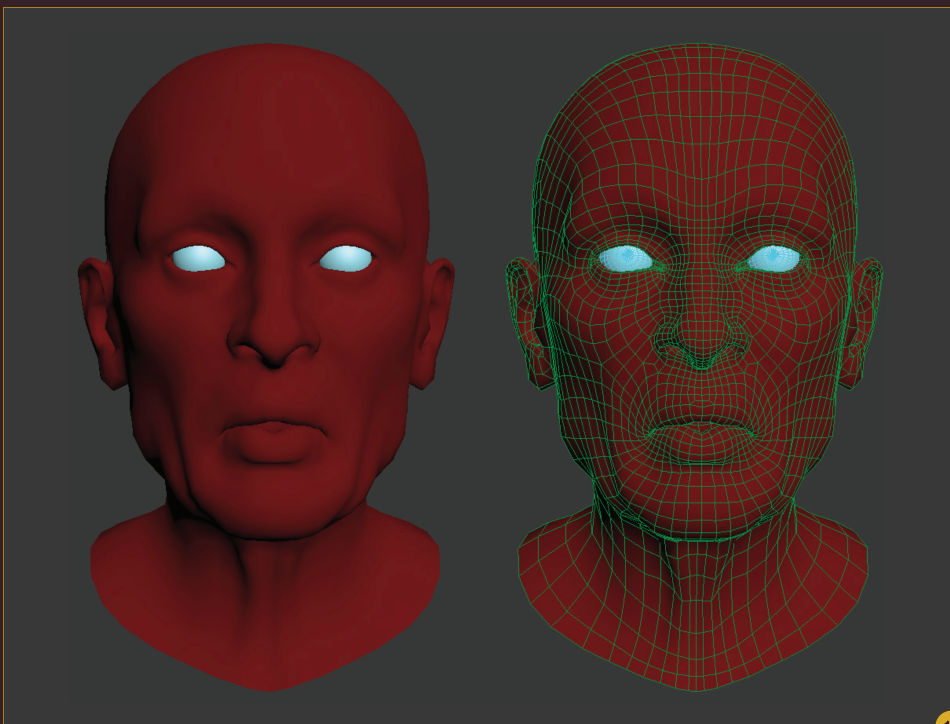

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So I export my model (with no UVs) as an OBJ into ZBrush (**Fig.08**).

In ZBrush I don't add any divisions to my model; I just use the base model I just created and start moving it around using the Move brush and the Move Topological brush. The Move Topological is a very useful brush that allows you to move the lower lip without affecting the upper lip, for example, and all that without having to create groups or masks (**Fig.09**).

The main reason why I don't want to add divisions at this point is because I want to make sure that I won't need to change my topology to support the new deformations. By doing it this way I don't need to add or move cuts, and I am able to move on to the next part without too much hassle (**Fig.10**).

Now I'm all set and ready to start sculpting in ZBrush. See you next time.

Rodrigue Pralier

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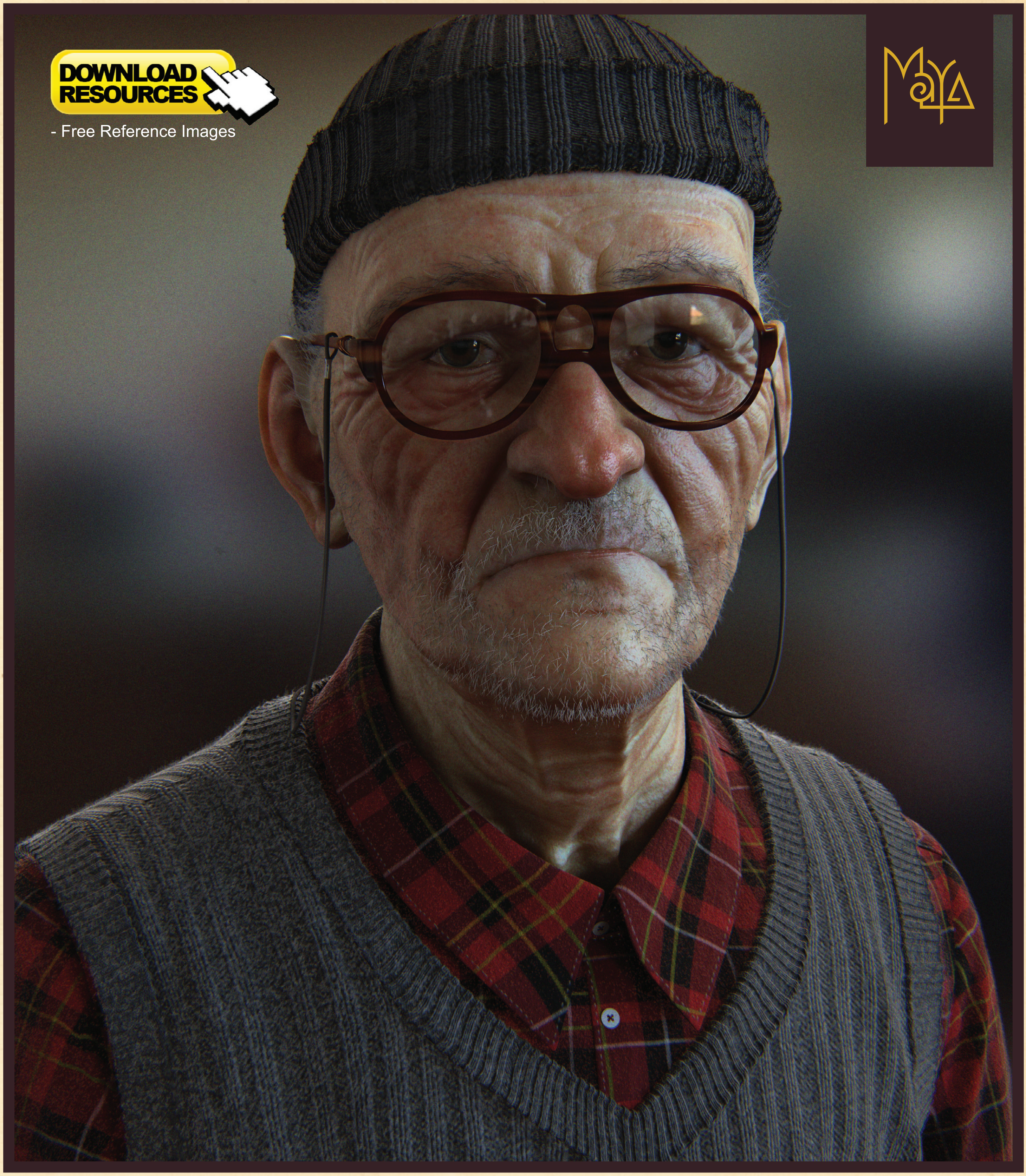
CHARACTER PRODUCTION



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Chapter 01 – Low Poly Modeling

Software used: Maya

Basic Modeling

Hello my name is Anto Juricic and I am a CG artist specializing in the creation of believable CG characters. In this series of tutorials I am going to walk you through the numerous tasks involved in creating a highly realistic render of an old man. As a core application I have chosen Autodesk's Maya and I will use it for the majority of tasks in this tutorial.

Although Maya is a powerful tool by itself and capable of both geometry sculpting and texture painting, it is capable of creating better results when used in conjunction with applications like Photoshop and ZBrush, which are going to be our major texture creation tools. With that said let's move on to the first step.

Setting up Image Planes

The edge extrusion method is possibly the easiest way to block out the basic shape of a human head, and for that we will rely on a pair of reference images that we are going to load as image planes. I have provided you with a side and front image of this character as a download with this tutorial so you can use the images to follow the tutorial (**Fig.01**).

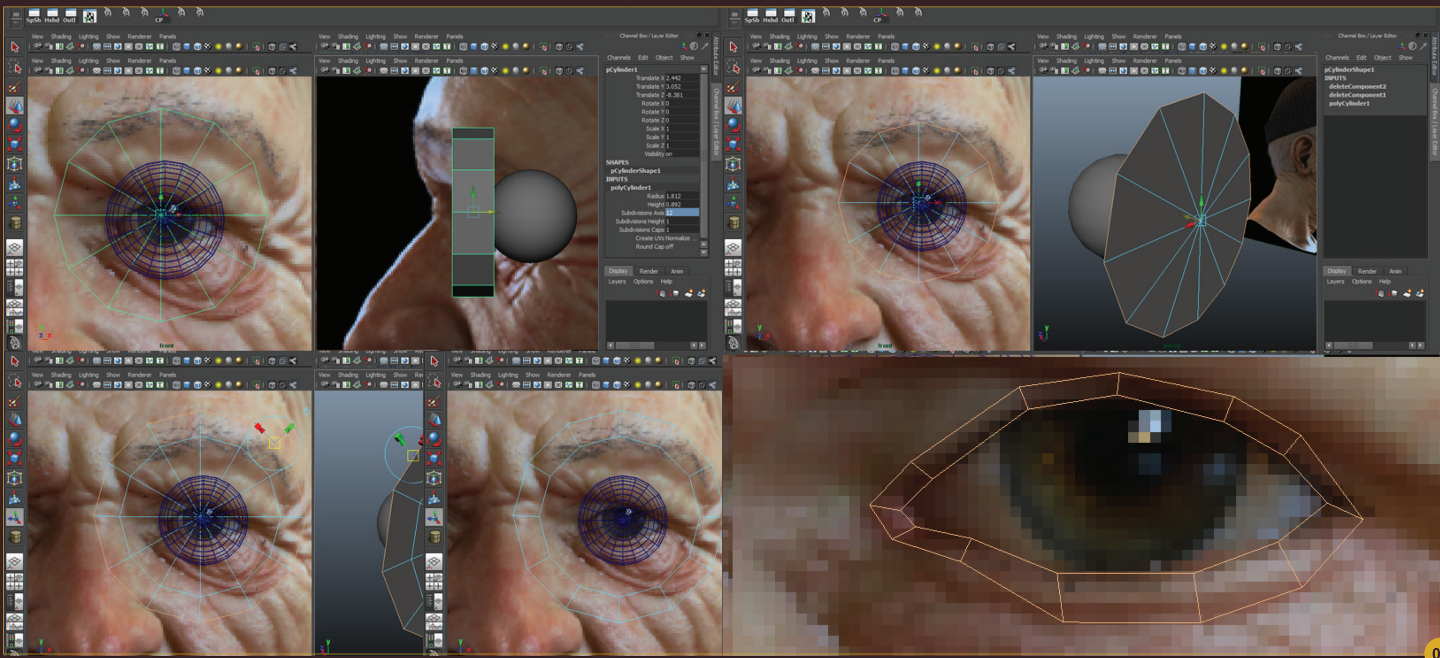
You can use any reference image you like as long as they come from the same person and show a front and side view. Let's first spend a few minutes preparing the images so they align perfectly once we load them into the Maya. Load the front image into Photoshop and pull down a few guides to mark the position of the eyebrows, center of the eye, nose tip and bottom, upper lip, center of the mouth, bottom lip, tip of the chin and bottom of the chin. Also place a guideline along the center of the face.

Now, using the Crop tool and its transform controls, extend the image size to the right so you can fit a side image in it. Place the side image to the right of the front image and scale, rotate and move it until you align all the facial features with the guidelines matching the front image. Don't worry if some parts don't line up 100% perfectly; it's probable because of the lens distortion of images.

If your model's head is slightly tilted to one side you can use the front on view to adjust and correct the image. With this done remove the guidelines and crop the images again, removing the space around the images. Also create two separate files, one for the front and one for the side view, and save the files.

Now go into Maya. In the menu select a new image plane and press Load Image. Select your previously prepared front image. Repeat the

01



02

same process with the side view. Image planes, by default, are created at the origin of the scene and crossing each other. To get image planes away from the center and make some space you will need to adjust the attributes for the image plane. Select the front image plane from the perspective view, go to the Attribute Editor and pick the Image Plane1 tab. Search for the Placement Extras options and center the parameter. Set the third number box, which represents the Z position, to 40. Repeat the same process for the side image plane and type in 40 in the first box for the X axis offset.

Poly Modeling

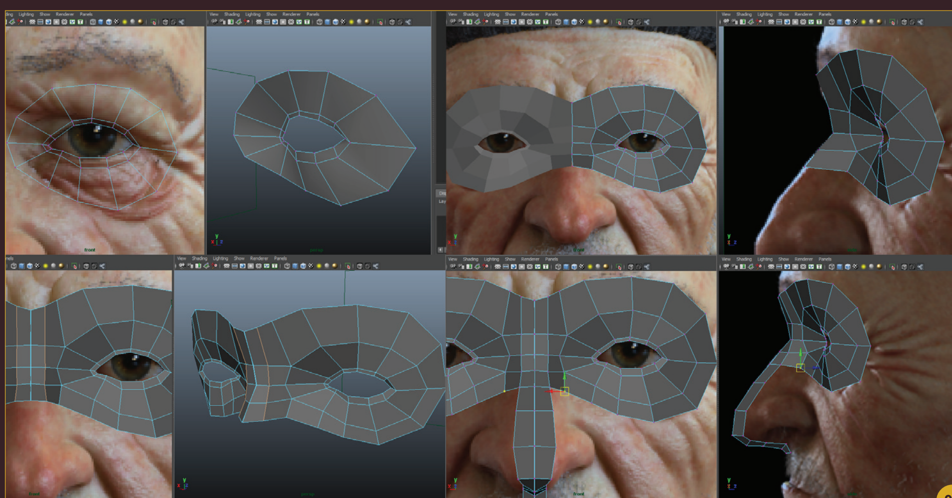
Now we have our preparation done it's time to lay out some polygons, so let's start with a temporary eyeball. You can find all your poly editing tools in the Edit Mesh menu, and you can add those you use most to your custom shelf by selecting a tool while holding the Shift and Ctrl keys.

Create a polygonal sphere and adjust it to match the position of the eyes from your image planes (both front and side). From the front view create a cylinder with 12 sides, which is slightly bigger than the eyeball, then place it in front of the eye. We will use this cylinder to shape the first row of polygons for the eyelids. Delete the polygons responsible for thickness so you are left with just a plane circle. Select the boundary loop from this circle and extrude it outwards. Delete the inside so you have a ring shape. Also make sure that you have your normal's facing the right direction. Now roughly align the vertices, following the front and side reference images, to trace out the shape of the eye. These first few steps are illustrated in **Fig.02**.

Now select the outer border edge once again and repeat the extruding process, shaping it roughly to mark out the shape of an eye socket. Make sure you align the newly created geometry from the side view as well as the front view. Select the two edges that separate the upper and lower eye lid, and extrude them towards the center of the nose bridge. Align this from the side view too. Now select the border edges, except ones at the center, and extrude them once again to circle the cheek and eyebrow.

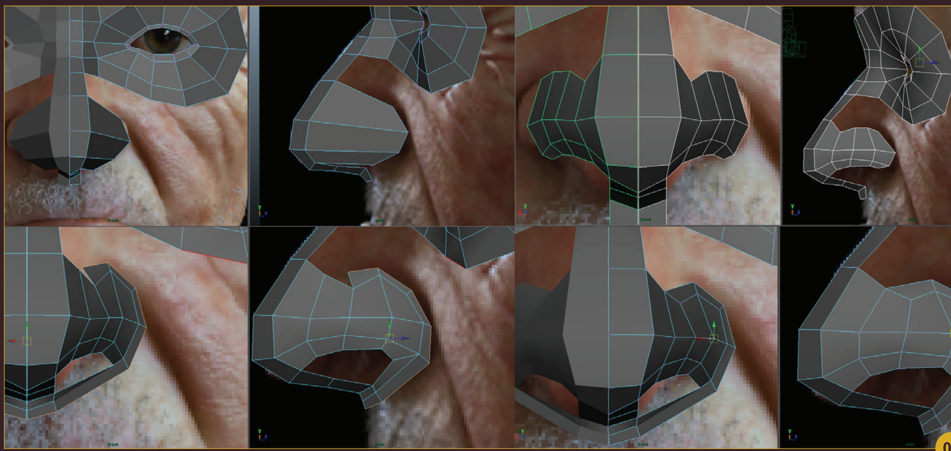
This is a good time to duplicate this piece of geometry to the other side of the face. Select the geometry and go to Edit > Duplicate Special and in the Scale option type - 1.000 to X axis only.

Move the duplicate to the other side of the face. Cut the bridge of the nose vertically by inserting an edge loop. Don't forget to always realign the new geometry from the side view. Now let's block out a nose shape by extruding down the nose bridge to the base of the nose (**Fig.03**).



03

Make seven extrusions along the nose and then one more for the nostril. Select the second, third and forth edge from the nose's bridge and extrude them towards the edge of the nostril. Insert three edge loops vertically to the new geometry and adjust it using the front and side view as a reference. Don't be afraid to go to the perspective view from time to time to check your progress in 3D and maybe make some adjustments. Select the last edge from the base of the nose and last edge from the nostril, and bridge them to close the shape. Select six edges starting from base of the nose all the way around the nostril and extrude them out. Merge the last vertex with the corresponding vertex on the nostril, as illustrated in **Fig.04**.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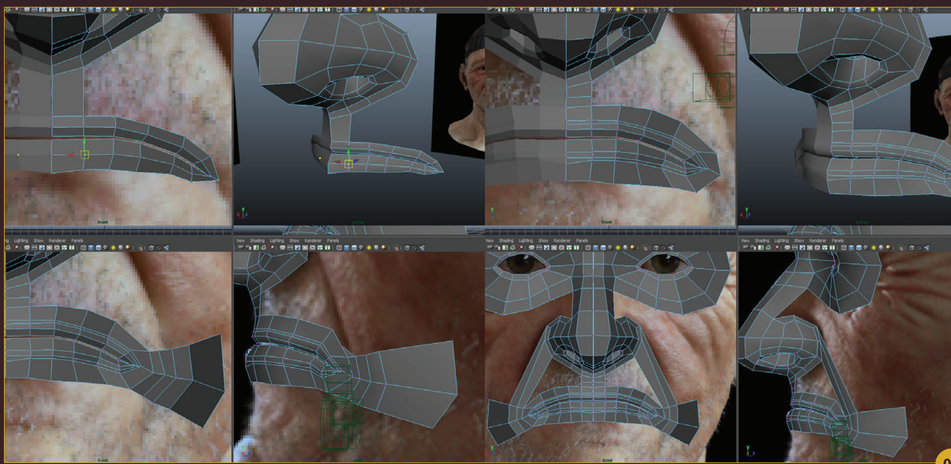
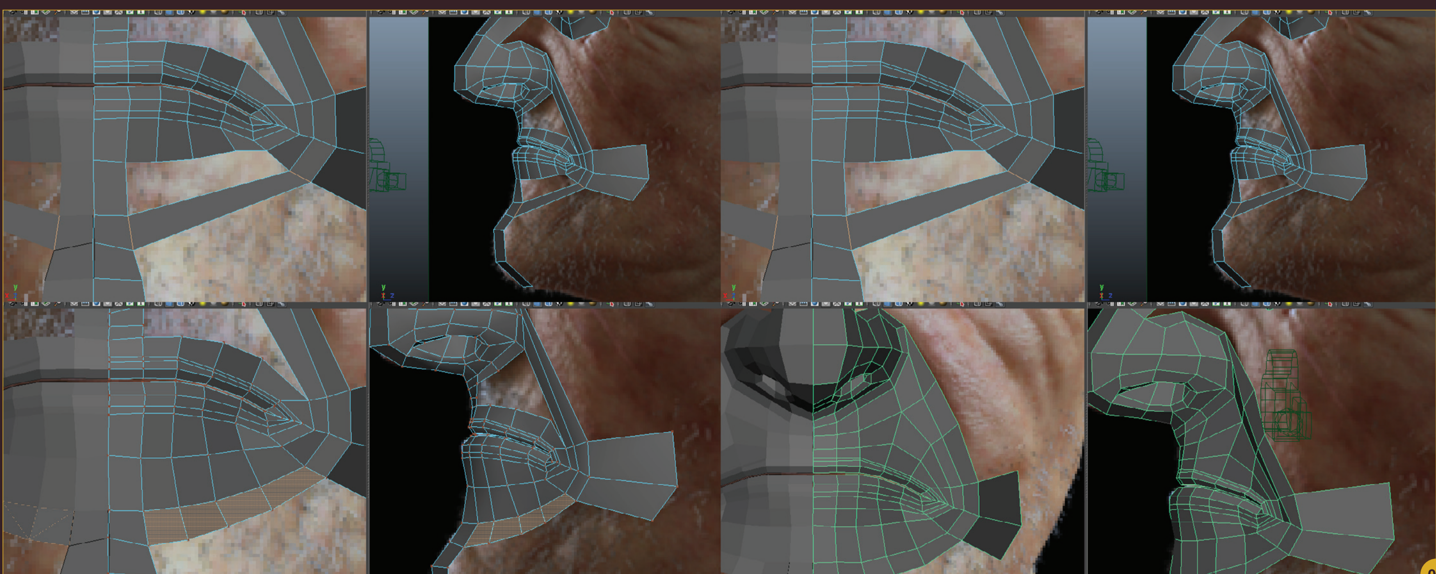
Split the edge at the center of the long polygon that bridges the nostril and nose base, and reshape it to a circular opening. Bridge the polygons to fill the gap between the nose tip and the mask shape.


05

Select the nostrils' opening edges, extrude them a few times and translate them upwards to shape the inside of the nose. With this complete let's move on to the mouth.

Extrude two lines from the base of the nose to the mouth, then make ten extrusions circling the mouth. Split the newly created ring by inserting a edge loop at the center. Add one more loop to define the mouth line. To finish the basic mouth shape, extrude the inside loop to form the mouth's thickness. Split the long polygon that bridges the mouth and nose by adding two edges, and extrude one more circle around the mouth. Now extrude two edges at the corner of the mouth toward the cheek. Split these two faces twice near the mouth's corner. Align these edges to the nasolabial fold using the front and side references. Bridge the two faces from the laugh line to the nostril, as illustrated in the last step of **Fig.05**.

From the base of the mouth make five extrusions to outline the chin, and bridge the laugh line with chin, as illustrated in **Fig.06**.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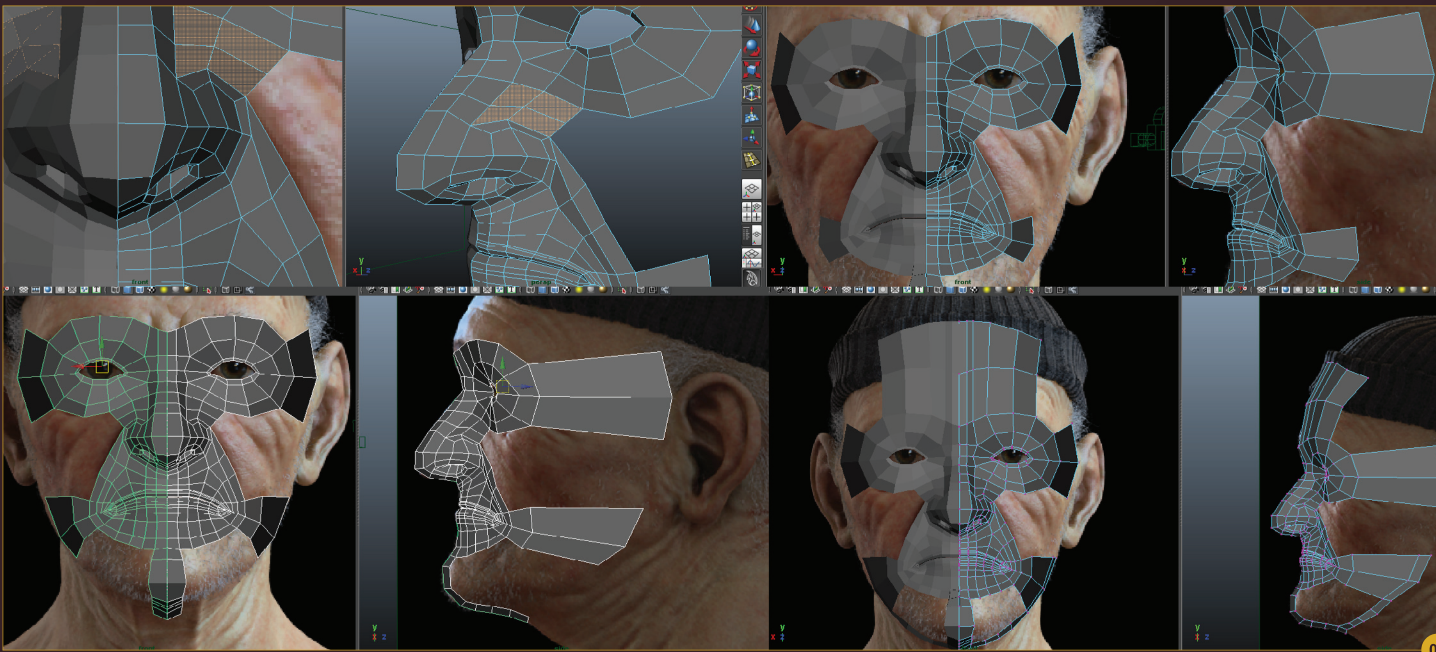
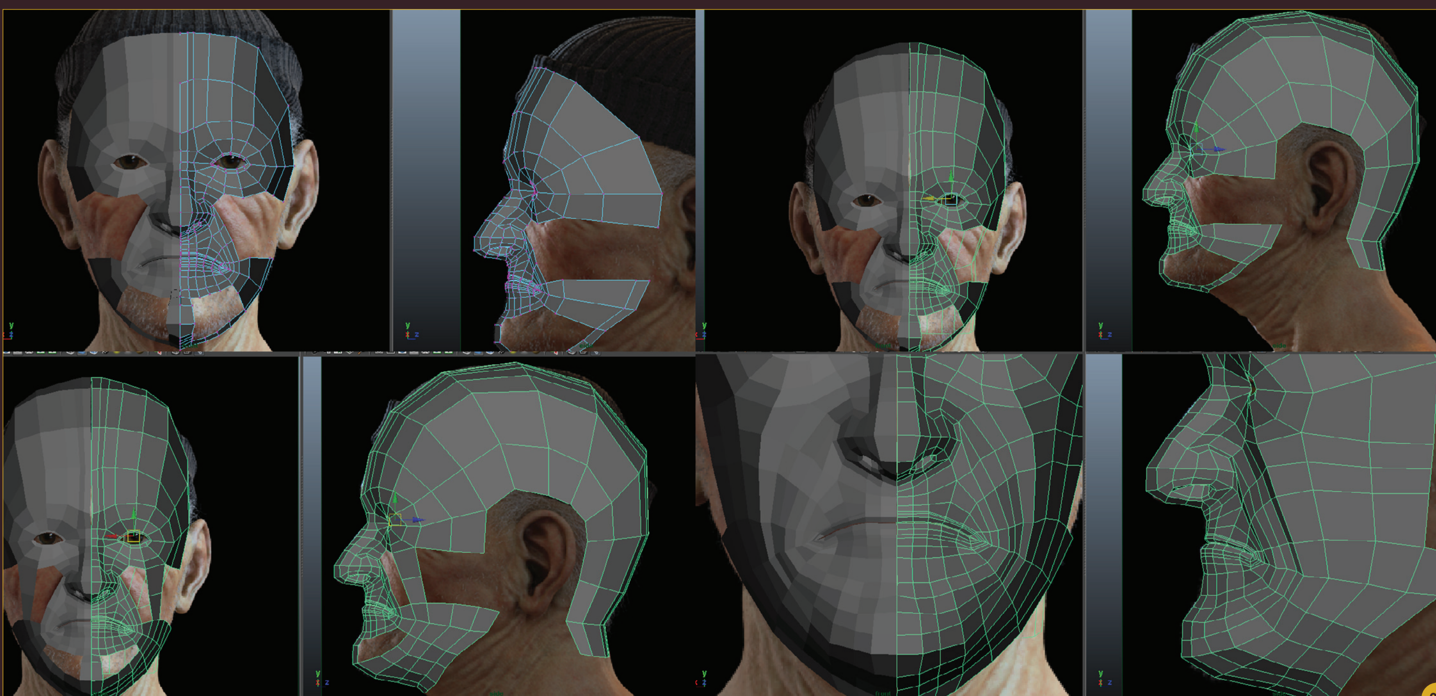

07

Cut along the polygon three times and fill in the gap. Add two edges to cut along the laugh line polygon, and fill the gap by bridging the mouth and the base of the nose.

Bridge the two polygons from the nostril to the corresponding polygons on the eye mask. Extrude two edges from the side of the mask to create a temporal area. Do the same for the cheek and add a few extrusions from the cheek to the neck. Add one more edge to the cheek polys and connect it to the last polygon from the chin extrusion. Select five edges from the top of the mask and extrude them twice to form a forehead shape (**Fig.07**).

Split the long temporal poly and bridge it to the forehead. Continue extruding the forehead all around the head, all the way to the neck. Reshape the new geometry to form a smooth shape. Insert another edge loop to the cheek geometry right behind the laugh line and connect the cheek to the eye geometry. Do the same to connect the cheek and chin. Don't be afraid to reposition some parts of the geometry at any time, and add or remove some of it if you feel it's necessary. Make additional splits to the cheek geometry to match the edges of the jaw geometry. Fill the gap between the cheek and jaw by bridging between faces. Use the same technique to fill in the rest of the gaps, as shown in **Fig.08**.

Also connect the remaining opened faces, as illustrated in **Fig.09**. Select an open face from the back of the neck and make enough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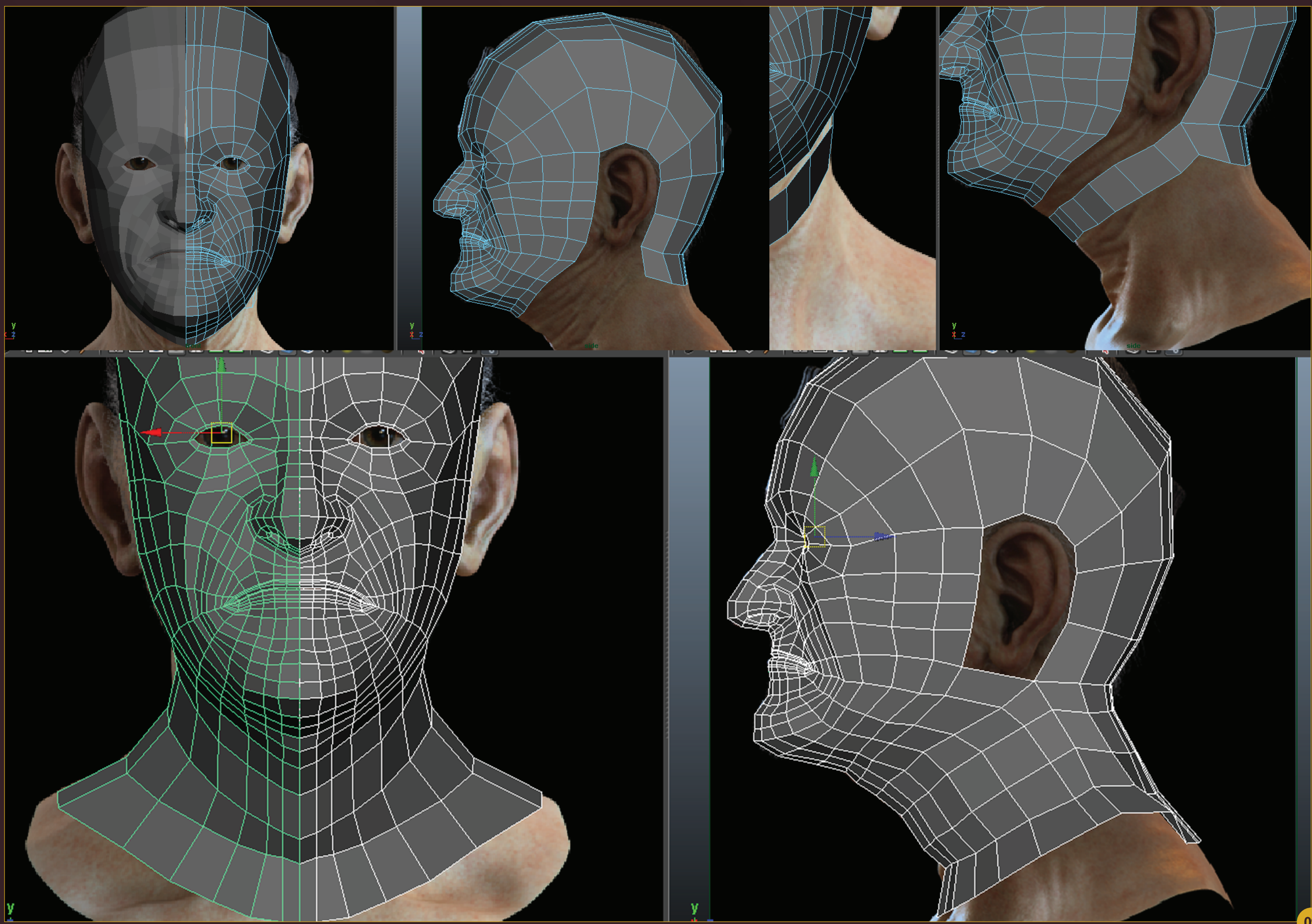

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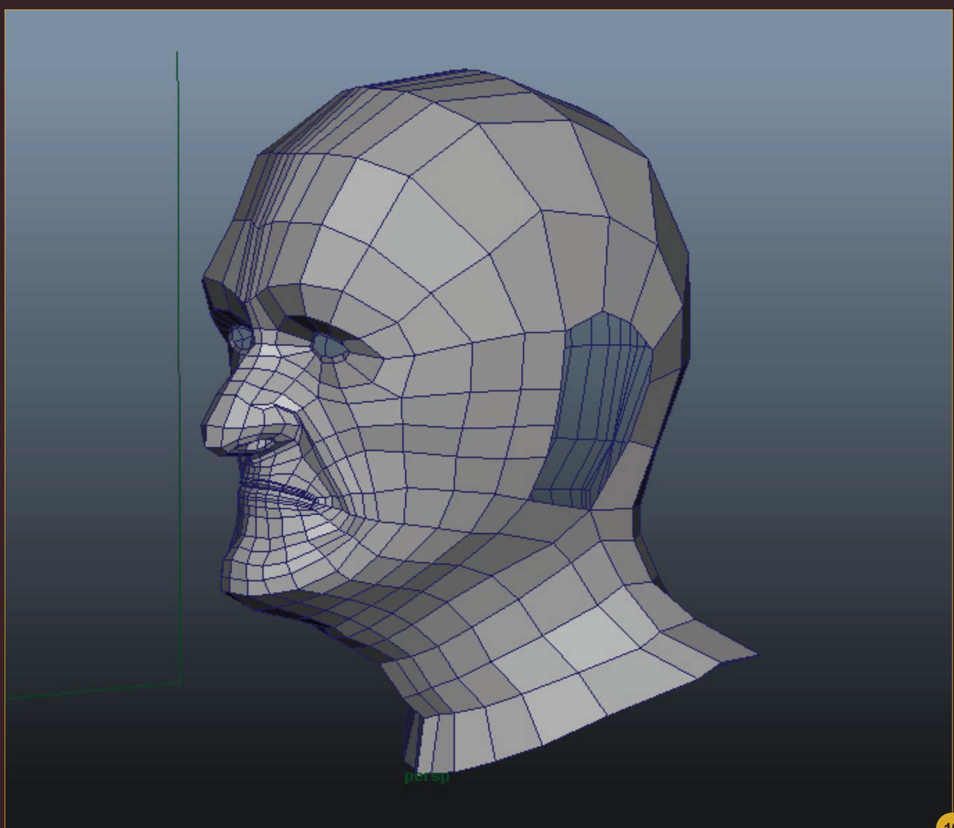

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extrusion to match the jaw line and fill the gap. Select the open loop on the neck and extrude down as many times as necessary to ensure equal distribution of geometry. Also make sure you delete the history from time to time.

Now go to vertex mode and press B on the keyboard to adjust the falloff radius, which is going to help us do some proportional editing. Go to perspective view and have some fun with this tool until you are happy with your model. I hope you have enjoyed this tutorial; see you in the next chapter where we will be adding some detailed facial features. Check out **Fig.10** for my result after some proportional editing.

ANTO JURICIC

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Or contact him at:
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3DC next month

Here is what's in next months issue of 3dcreative

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Chapter 2 - Smoke 3ds Max & Maya

Building Droids
Chapter 2 - Medi Droid
by Tarik Ali

Sculpting Armored Beasts
Chapter 5 - Rhino
by Jose Alves da Silva

Character Production
Chapter 2 - Modeling the features
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Image by Piotr Tatar

"Everyone knows how birds love things like cornices, balconies and, of course, street lamps! They like to use these places a little like a public toilet!"

THE LANTERN

Making of by Khadyko Vladimir

3DC

I am sure that you remember Khadyko Vladimir's fantastic image Lantern from the gallery section of the January issue. In this month's issue he walks us through his entire process from gathering reference images through to texturing and post processing.

THE LANTERN

Software used: 3ds Max

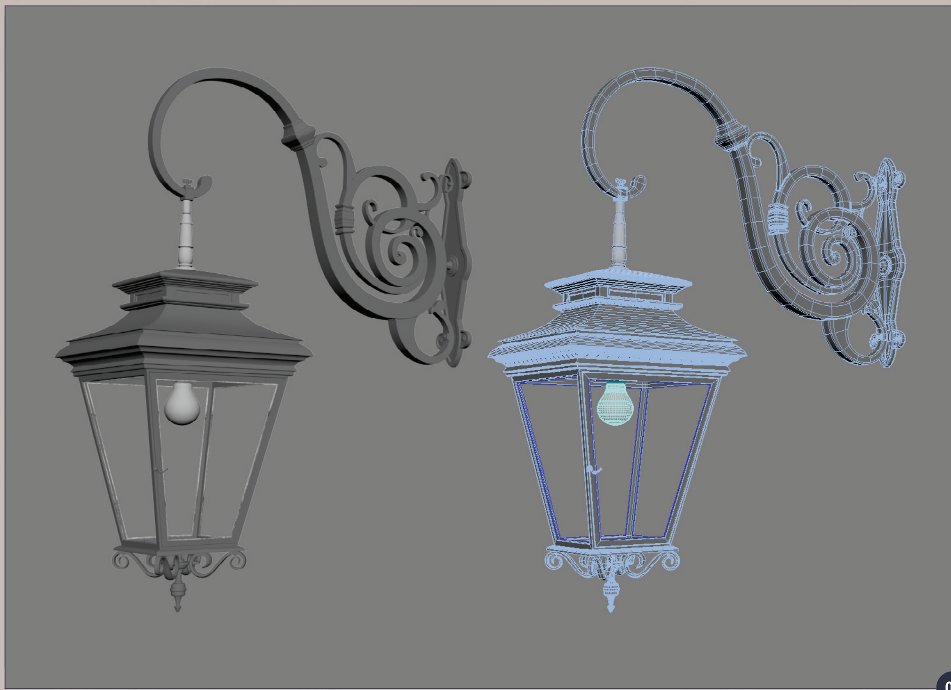
Hello everybody! My name is Khadyko Vladimir and in this article I will be explaining the steps I took to create my image called *Lantern*. I started this image by simply looking for a nice reference image on the internet of something that I felt I wanted to model. I found a great image of a lantern, but the picture was taken in the daytime. I wanted to change that in my image and show the lantern in the evening as I felt that this would be a much more interesting image. The lantern was modeled in 3ds Max, but I also used V-Ray, ZBrush, Photoshop and After Effects.

The model of the lantern itself was rather simple, so rather than explain the whole process I will show you how it looked when I had modeled it (**Fig.01 – 02**).

The welding that is visible on the model was created using a combination of a few modifiers applied on the rectangular spline. By using the Sweep option and a gradient ramp in the displacement slot, I was able to achieve a wavy look (**Fig.03**). I customized this so that the effect could be tiled in the necessary areas. I also used some noise to give it a more random look.

The spider's web was pretty tricky to achieve. It was created on a plane (**Fig.04**). I used V-Ray dirt as the material for the lantern, as you can see in **Fig.05**. The spider's web's plane seemed to create a line of dirt where it crossed the lamp and I couldn't correct this by playing with the exclude/include settings. My idea was to solve this by minimizing the intersection area, which seemed to work. I also applied a V-Ray displacement mod to this plane at - 0.5mm (the high map and opacity are the same textures). This did a great job here because it shows the volume on the thin detail, but also shows a nice, subtle highlight.

For the background I used some references from cgtextures.com and quickly modeled two



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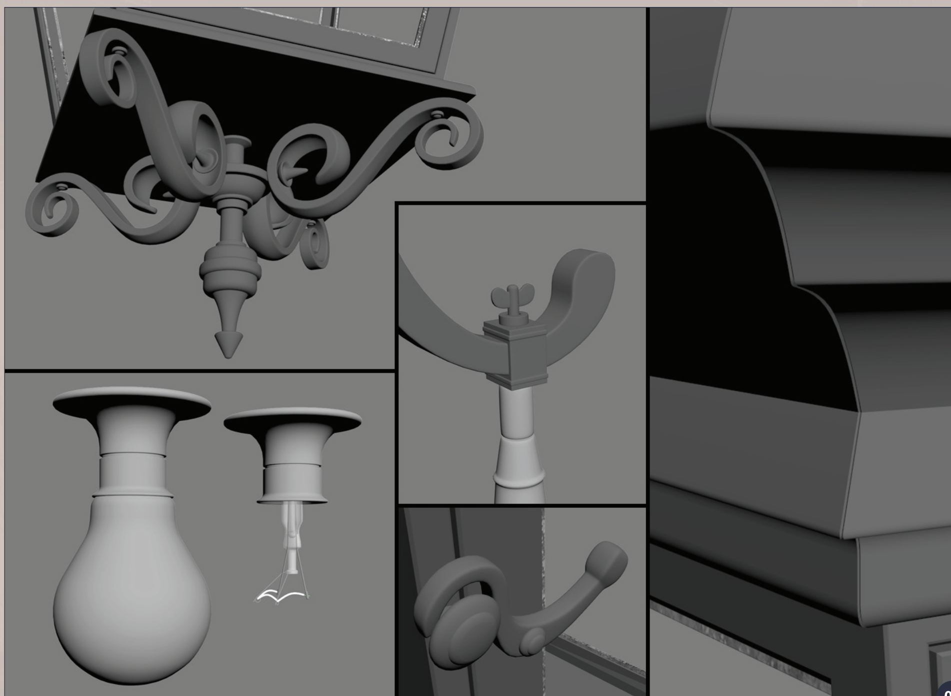

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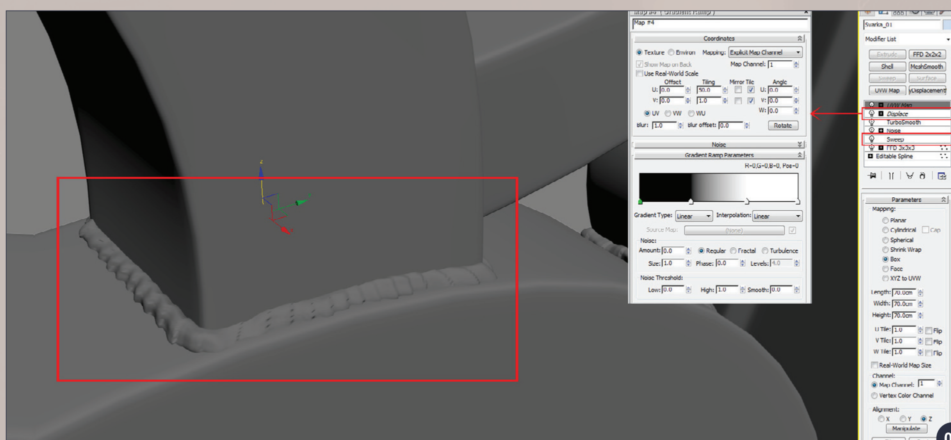
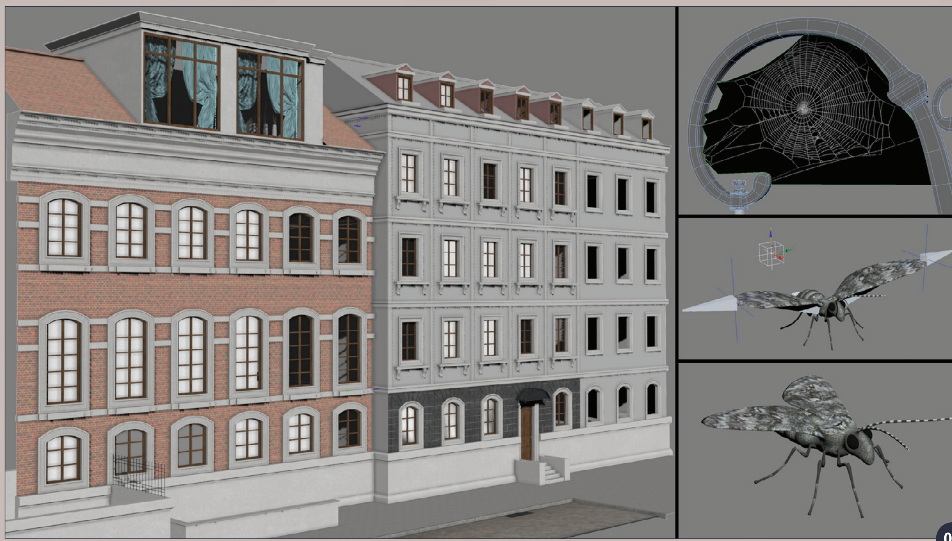


03

buildings, which you can see in Fig.04. In the final image you can only see a small part of the buildings as I changed the focal length of the camera from 25 to 50, meaning the background was blurred as it looked in original reference image.

The bugs help to bring the image to life. I wanted to make them big, but not look ugly and awful. I made two types of bug; one with open wings and the other with closed. The first of the two bugs was rigged so it could be posed or animated. I then created five variations of the bug, meaning that I could add them to the image and make minor changes to them such as twisting them to make them look unique. The final step was to add some Motion Blur, which was created using the V-Ray physical camera as I feel this looks better than when it is done in post-production.

As you will see in Fig.05, I used Blendmat as the base for the different materials used. The first of the two metals was a black metal covered in rust. The second material was much lighter than the first and was used to create the effect of dust. A Falloff map with a world Z-axis direction was used as a blending mask, and I blended the black and light metal textures using the Invert Normal function in the vraydirt map options. It gives a very subtle effect, but it really helps to make objects look real.



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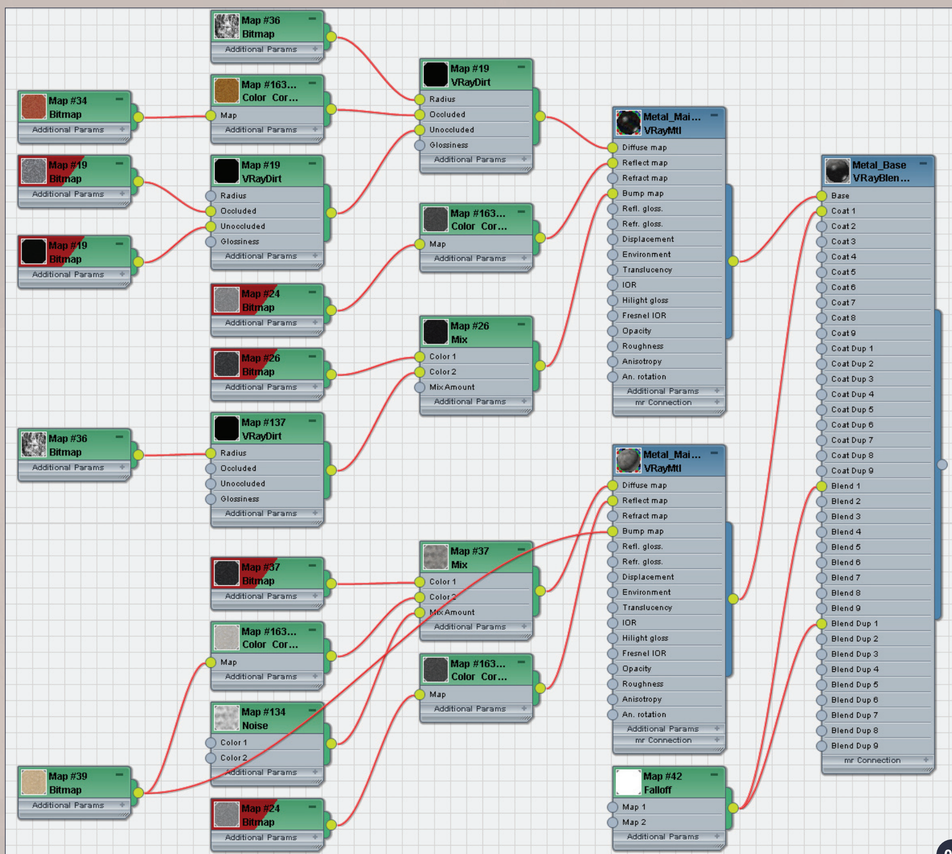

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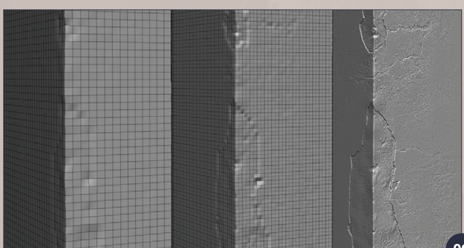

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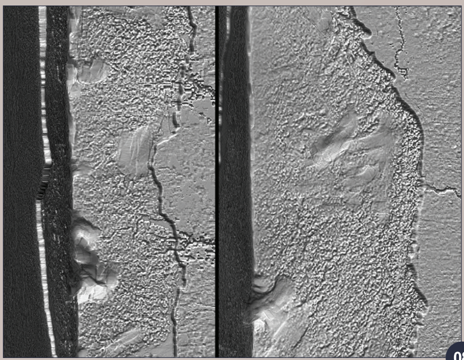
Then it was time to move into ZBrush. This is a great and powerful tool, and it helped me to achieve nice detail on the wall (**Fig.06**). To do this a base object was created and unwrapped in 3ds Max. In Photoshop I created a diffuse texture and based on it a black and white map that was used as a mask for sculpting (**Fig.07**).

07

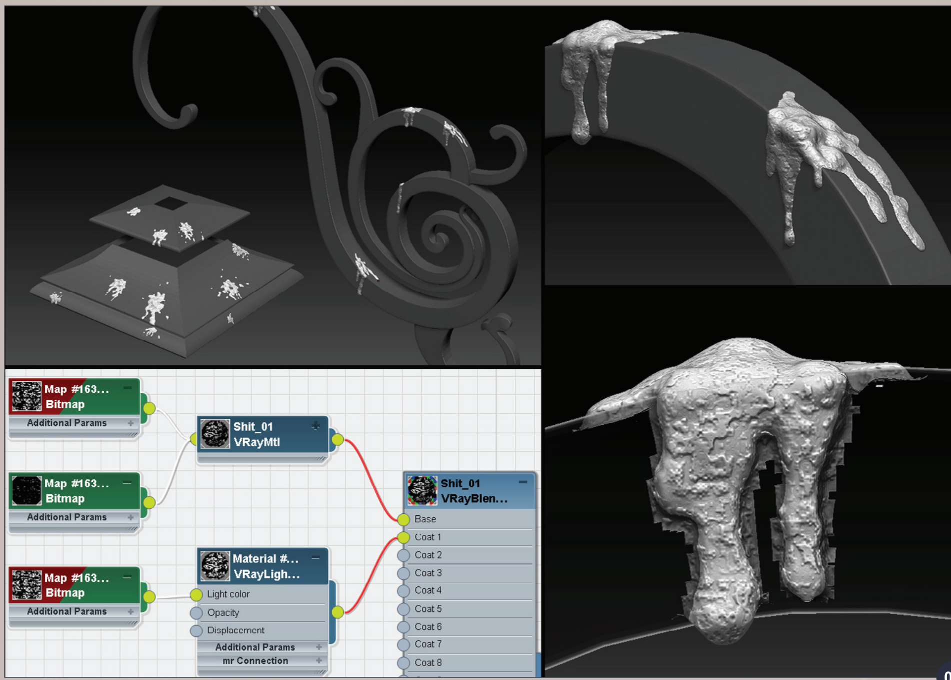


08

In ZBrush I applied this map, made a mask and, with the Standard brush, sculpted the detail. This technique gave me more control over the level of displacement and was really easy to use.

The Claytubes brush was the best way to make all the dents and small details on the concrete (**Fig.08**). The next step was to bake a Displacement and Cavity map, which I put over the Diffuse map with opacity of 15 – 20%.

Everyone knows how birds love things like cornices, balconies and, of course, street lamps! They like to use these places a little like a public toilet! Because of this I decided to add some of this kind of detail on the lantern for more realism (**Fig.09**).



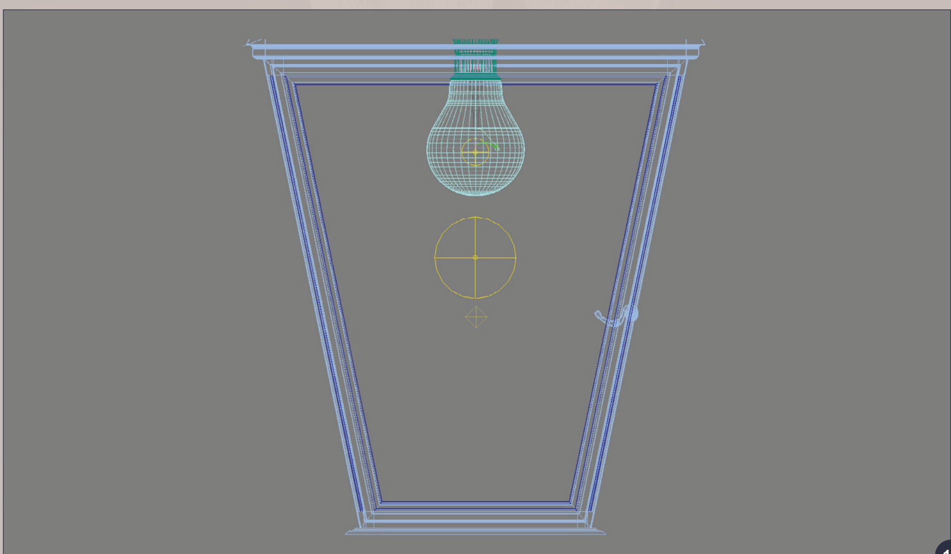
09

For this task I used ZBrush. Two subtools were created, but I offset the second one with a negative value in the Deformation tab of the Tool palette. With the Standard brush I started to paint some smudges and add more detail to them so they could be placed in different areas and look unique. I also applied some surface noise. One of the lower subdivision levels was exported, unwrapped and returned to ZBrush so I could bake Displacement and Cavity maps. For the material I used a Vraymat with the base settings and a Cavity map in the diffuse slot, but in the render it looked very dark. Blending this material with a vraylightmat solved this problem.

For the environment lighting I used a HDRI that gave a nice blue color to the scene. All the other lights were yellow with some variations. The background was lit with two spherical V-Ray lights. The windows were planes with vraylightmaps on them. Only the upper left room had a light sphere inside it.

For the lantern I used three different light sources (**Fig.10**). The main task was to avoid over-burning the lantern's interior. A V-Ray light sphere was placed inside the light bulb and only affected the bulb's glass, which had a dirt mask in its refraction and glossy slots. I then used omni lights for the light on the environment around the lantern. This made the lighting very easy to control.

All of the post-processing was done in After Effects because I really like the Replace Footage function. It's much easier to re-apply all of the effects to an updated render than to do it all over again in Photoshop if you find something you want to change. Everything I did was pretty regular; contrast adjusting, color correction, some glow and adding depth of field. I hope that you have found this interesting.



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Khadyko Vladimir

For more from this artist visit:
http://khadyko.daportfolio.com
Or contact him at:
work_3d@yahoo.com

Digital Art Masters

Volume 6

With the release of the latest volume in the popular *Digital Art Masters* series, we have some exclusive chapters for you...

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This month we feature:

"Carrier"

by Neil MacCormack

The following shots of the “Carrier” book pages are featured here in full-resolution and can be read by zooming in...

Carrier

By Neil Maccormack

Job Title: Freelancer

Software Used: LightWave 10, Photoshop CS5

Inspiration

Normally when starting an image I would work on a concept sketch or pencil drawing as a reference before starting any of the 3D work. This time however I didn't use any drawings and simply started with a box in LightWave. I knew that I wanted to portray an action scene featuring a ship landing in a rocky desert environment, and I also knew I wanted it to appear as a mixture of 2D and 3D. The time of day dictated the palette, along with the surrounding environment. With all this in mind I started modeling the main ship and took each step as it came.

01a

01b

Modeling

You will be able to tell from the main ship model (**Fig.01a – b**) that the modeling isn't the most complicated part of the image. Unless I am preparing a model for animation or for film, I don't generally concern myself with high resolution details unless necessary. I used a standard box modeling technique, beveling out some details on the ship to form an overall design. I added some fans and grills at the back for the engines, and on the wings, to hopefully make it appear as though there was far more detail than there actually was.

The rocks and environment followed the same principals, with the basic shapes being extruded from a box once again, and then subdivided and tweaked until I was happy (**Fig.02**).

The smaller foreground land vehicle was altogether more complicated and was actually created for a different project than this, but I thought the shape and design fitted well into the atmosphere of the image and so I added it in later on (**Fig.03**).

02

03

Texturing

With the intention of over-painting this 3D render in Photoshop, I knew I wasn't going to go into too much detail on the texturing. I created some basic UV maps in Photoshop for the ship and added some standard metal textures to the model. The rocks were done in a similar way using a rock texture mapped onto the object in Cubic mode so I never had to create any UV maps at all.

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04

Scene and Background

With all the models done and textured I then started to think about my scene and composition. I created a matte painting in Photoshop that would form the background of my 3D scene and then camera-mapped this onto the ground plane I had constructed earlier (**Fig.04**).

Once this setup was tweaked I started loading the objects into the scene until I found a satisfactory composition. This included a second low resolution ship in the background to add more depth to the scene. I chose a slightly tilted camera angle in the final scene as I felt it made the image slightly more dramatic and showed off the best angle of the ship. You can see how this looks through the camera in the 3D layout in **Fig.05**.

05

Lighting

As I had already painted the background this gave me a huge start with the lighting as it depicts the time of day and general color scheme. As an environment, I wanted something desert-like and knew the sun would be a reddish-brown color, quite low in the sky and producing long shadows. I used LightWave's Radiosity to simulate the bounce light using the background matte as the light probe source, which generally gives the lighting a more realistic color.

In **Fig.06** you can see the Open GL render of the scene, complete with lighting and background fog, and again I used the matte painting as a source.

06

Rendering and Post

The final render was 4068 x 1740 pixels, which I think took around 12 hours to render. You can see how the original render looks directly from the 3D program in **Fig.07** before any painting or color correction took place.

Once I had my render in Photoshop I decided to dirty up the image and alter the colors to make the scene more dramatic. This meant darkening everything somewhat and tweaking the colors to add more blue into the palette. I also painted in some smoke and dirt over the ship to create the impression it was either landing or taking off, and also to make it interact more with the environment.

I overlaid some more metal images across the ship to add extra texture, painted in the lights and concluded with some other rock textures to complete the image. **Fig.08** shows the final image with all the layers active in order to give you an idea of the total amount of work done in Photoshop.

07

08

Artist Portfolio

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